THE ROLE AND RESPONSIBILITY OF PHYSICAL EDUCATION:
Latest Thinking Relating to Child Development and the Understanding of UK Childhood Environments

Report commissioned by the Top Foundation

Lead researcher: Dom Haydn-Davies, Roehampton University:
Email: D.Haydn-Davies@roehampton.ac.uk

Research Team: Victoria Randall and Jon Spence

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1. Executive Summary

This report has been compiled to provide a review of current literature and thinking concerning the development of children between the ages of 4 and 7. The focus of the discussion relates to this age group, however, what occurs before and after these ages has also been considered to put the developments in context. Literature has been considered through three key themes relating to development, these being **the physical**, **the social** and **the cognitive** aspects of development. The aim of the review was to examine expected patterns of development and to identify the needs of the typical 21st century child.

A detailed consideration of the literature available provided a range of contextual and background information relating to all aspects of child development and this review has drawn on literature from within the United Kingdom and from across the world. Within the scope of this review it is impossible to include all of the available literature, however, that which has been included has been selected to highlight consensus viewpoints and some contrasting opinions.

From the review it is clear that there are a number of key areas of consensus around the processes involved in child development, the factors influencing the rate of development and the reasons for delays in development. The discussions in this review highlight these and the recommendations are based on the consensus view and interpretation of how these views impact on the broad area of physical education. It is clear that there is a need for teachers and other professionals to gain a clear understanding of what children can do, what they should be able to do and how they can provide the optimum environment in which to aid the development process. The recommendations set out below are designed to ensure equity of opportunity and to identify how child development in its broadest sense can be enhanced. As the physical education profession has claimed previously, the role of physical education is clearly shown to go beyond just the physical and we are able to have an impact on a wide range of developmental areas and issues, which will ultimately have an impact on a child's successful development into adulthood.

Key Recommendations:

- Approaches should be provided to allow development across the physical, social and cognitive domains.
- Young children should be supported in becoming competent movers. This has implications for Initial Teacher Education and the provision of Professional Development.
- Development is viewed as being age, gender, ethnicity and socio-economically related but not dependent. In other words, planning for children's learning will need to take into account the individual needs of every child and the context in which the learning is taking place.

- Practitioners need to be made aware of potential limiters to progress and that this is shared with parents to ensure that all those involved in the care and education of the child are able to maximise potential.
- All adults involved with the child are aware of their potential positive and negative influence on children's progress and the importance of them becoming informed about expected developmental progress and recommendations.
- More needs to be done to help society understand expectations of early childhood rather than helping children to understand society's expectations. The need for children to be treated as children and not as miniature adults is key to ensuring that they develop the necessary skills to eventually become functioning members of society.

The value of understanding the developmental processes and the influencing factors is clear. Those responsible for ensuring children are given the best start in life need to consider the information included in this review and to utilise the findings to ensure that all children are provided with the opportunities and the challenges they need to reach their full potential.

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1. Introduction

This review of literature supports the various aspects of the Key Stage 1 physical education project and provides a theoretical basis and understanding of the current situation and what can be improved in order to provide solutions to the challenges faced by classroom professionals in trying to provide a high quality experience in physical education for their pupils. The review includes analysis of historical and current thinking relating to areas of child development and is based on an investigation following a thematic approach to the available literature. Literature trails were followed, based around the key themes outlined in the objectives below, to identify how thinking has developed and to show how understanding of influencing factors has been developed. Some seminal works are included as they form the basis of current thinking.

Working with children aged between four and seven is exciting and challenging. As children enter what can be termed 'early childhood' they are beginning a period of transition from being reliant on adult support to managing aspects of their lives with more independence. In order to support those who help children within this period of their lives, specifically within physical education, it is imperative that the field – physical education – as well as the participants and beneficiaries – the children – are understood.

Physical Education is an area of learning with which children engage at all stages of their development arguably from 'cradle to grave' (Whitehead, 2010). At school this is as a curriculum subject or an area of development. In life it can be seen as how they manage their physical interaction with their world and their peers. The study of child development is well established as a research discipline as is the subject of Physical Education. This report aims to summarise these fields of study and draw out the most relevant and pertinent information and theory to the development of a support framework for early childhood practitioners in physical education. It will highlight the latest thinking in the focus areas selected to provide a contemporary view of developments.

The report follows the principle of an interactional view of child development. Gallahue and Ozmun (2006) consider this a dynamic systems approach that maps the expected biological pathways and routes of development with the influencing factors of environmental and task experience. This is in contrast to some historical models that rely more on a maturational process that does not fully appreciate the significant influence that environment and society has on child development.

Children do not develop in isolation from their world (Scarr and McCartney, 1983) nor do different areas of development fail to impact on each other (Doherty and Hughes, 2010). There is a need to consider the child as a whole, made from inter-related component parts. An understanding of the parts is essential to understanding the whole, but should not been seen in isolation.

Analysis within this report will therefore focus on three inter-related areas of development – the physical, social and cognitive domains.

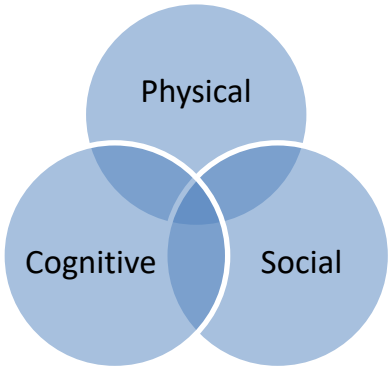

Figure 2: Inter-relation of domains of analysis of child development

- The 'physical' considers aspects such as growth and movement and the links with physical health
- The 'social' considers the concept of 'self' and how this links to the building of relationships with others
- The 'cognitive' considers the processes required to make the most of social and physical opportunities.

There are clear links, both in terms of research and practice, between these three areas and analysis of each will also shed light on facets of each of the others. Communication requires aspects of all three but for clarity will be analysed within cognitive development. Confidence is most readily associated with the social (and/or emotional) domain but within the context of this report has integral links with physical skill development. Links are made within sections where appropriate and are intended to reflect the interactional ethos of the report.

This report is structured to present the reader with the expected progress that a child may make during early childhood. This is contextualised by a consideration of what is likely to occur before and after and what factors may limit or enhance this progress. Information is also presented to demonstrate how contemporary society may be influencing this expected progress in all children as well as specific groups.

1.1 Aims of the Report

The aim of the report was to review the expected patterns of physical, social and psychological child development. This review will form the basis for a **profile of the needs of the typical 21st century child**, accounting for key markers. Specifically, the review will:

- Draw on recent research to provide an up to date overview of how a child develops in terms of physical, social and cognitive development.
  Areas Included:
  - Physical Development
    - Growth
    - Motor skill
  - Social Development
    - Self concept
    - Emotional

- Cognitive Development
    - Perceptual
    - Language

- Develop a profile of the typical needs of a modern British child (4 and 7 years) highlighting family groups, lifestyle markers and exercise profiles. Draw out any significant contrasting differences between ethnic groups, gender and socio economic status.

1.2 Methods of investigation

This review is based around a detailed review of literature following a thematic approach. The themes of physical, social and cognitive development were used to carry out on-line literature searches from a range of databases to identify the key authors in each area. Previous literature reviews were also utilized to identify key theoretical perspectives. Once the key theoretical perspectives and authors were identified reference trails were followed to gather consensus and contrasting viewpoints. The references selected for inclusion were those which provided a range of views and which were cross referenced to other key references in the report. Sources were used which were from textbooks, peer-reviewed journals, government publications and other recognized body publications (such as subject associations) to ensure all areas of interest were included.

Although this was a thematic approach it was evident that there is crossover between the three themes with many of the references covering 2, if not all 3 themes. The table below identifies the area covered by the references cited in the review and the inter relationships between the themes. The figures show the percentage of references from the 180 included, which cover each theme.

Table 1: Scope of the review: Areas covered by references

Theme	% of References
Physical	28.7
Social	10.4
Cognitive	10.9
Physical and social	14.4
Social and cognitive	9.4
Physical and Cognitive	5.9
Physical, Social and Cognitive	20.3

1.3 Definitions

For the purpose of this report the following definitions of terms are used throughout. These definitions are based on widely agreed definitions and are based on those utilised in research, texts and peer-reviewed journals related to child development.

Early childhood: the period of childhood between approximately four and seven years of age
Practitioner: any adult who directs or supports learning within an early childhood setting, such as a teacher, teaching assistant, Nursery Nurse, Key worker or volunteer
Setting: context for learning, for example school, Nursery, playschool, playgroup or other childcare context
Growth: increase in the size of the body as a whole or the size attained by specific parts of the body (Malina, Bouchard and Bar-Or, 2004: 4)
Development: when considered within the context of behaviour is the acquisition and refinement of behaviours expected by society (Malina, Bouchard and Bar-Or, 2004: 5)
Movement Skill: an observable, goal-directed movement pattern. Movement, not motor, is used as the descriptor because it emphasises the observable act of moving, rather than internal motor processes (Burton and Miller, 1998: p.5)
Motor Fitness: the quality of performance of a fitness task relating to coordination, speed, agility power and balance (Cooper and Doherty, 2010)
Self-concept: one's awareness of personal characteristics, attributes and limitations and the ways in which they are both alike and unlike those of others. It is how one views their self without passing personal judgement or comparison with others (Gallahue and Ozmun, 2006, p.279)
Self-esteem: the value that one attached to his or her own characteristics, attributes or imitations (Gallahue and Ozmun, 2006, p.279)
Motivation: a state of being energised to engage in an activity (Magill and Anderson, 1996 p.63)
Perceptual-motor processes: – involves the body receiving sensory stimulation, transmitting this information to the brain, integrating and interpreting to activation of movement. Sensory feedback on this movement completes the cycle. The components include body, spatial, directional and temporal awareness (Pickup and Price, 2007 p.53)
Health: is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 2010) For the purpose of this report we are considering health in terms of the impact on the child's ability to take part in physical activity and sport and in addition the contribution physical activity and sport has on a child's overall healthy development (Chandler, Cronin and Vamplew, 2007).
Cognitive development: the intellectual process of gaining, storing, recalling and using information (Kameen, 2000) and refers to the inner processes and product of the mind that lead to "knowing". It is all mental activity that includes attending, remembering, symbolising, categorising, planning, reasoning, problem solving, creating and fantasising (Beck, 2006)
Social development: understanding of the self in relation to sociability and relationships (Doherty and Hughes, 2010)
Social referencing: relying on another person's emotional reaction to appraise an uncertain situation (Beck, 2006)

2. Background and Context

Within this report, the three core themes of investigation, the physical, social and cognitive development of children are considered in relation to their influence on the specific contexts of Child Development, Education, Physical Development and Physical Education This section provides the background context to the project. The aim is to provide a rationale for the approach taken within the report and also to provide important contextual information about the field under scrutiny. Firstly, the area of child development theory is discussed to highlight main themes contained within this field and to demonstrate how early childhood education works to support the overall philosophies of child development. Next, the field of physical education is discussed to consider how this might relate to early childhood theory. This final section then sets the scene for what is already known regarding physical education in early childhood.

2.1 Child Development and Early Childhood

Children develop from the moment of conception and this is affected by a number of important factors, some of which are fixed, but others are more transient. Some factors act to limit development, others work to enhance development or at least keep it on an expected path. Doherty and Hughes (2010) summarise the following key principles at work in child development theory. Child development is:

- a continuous process that contains many stages
- affected by an interaction between nature (genetics) and nurture (the environment)
- open to individual and cultural influences
- an active process in which children are involved
- an embodied experience which inter-relates the physical, social, cognitive and emotional domains

Major theorists in child development include Bruner, Vygotsky and Piaget. Their theories provide key perspectives on how children develop before adulthood and share many key points that have formed the basis of accepted practice within all areas of education. Many of these theories have a particular focus on the early childhood period and the influence on practice within settings varies from being part of an overall philosophy (the importance of play) to being a rigid implementation of the principles (for example Montessori Nurseries).

There are many contrasting theories relating to early childhood development (and childhood as a whole) and how best to maximise potential. All of these different theories add a range of different perspectives to the debates around early childhood provision and how to provide the best opportunities for children both at home and when in school/nursery. The theoretical underpinning of work in this area continues to develop. The core thinking has evolved from traditionally held viewpoints providing new perspectives on what can be done to enhance child development, that is, that understanding changes over time (for an accessible summary of child development theorists, see Macleod-Brudenell and Kay, 2008; Mooney, 2000; or Doherty and Hughes, 2010).

In relation to motor development, again theory has developed over time and there are a number of contrasting views, (see Pickup and Price, 2007: 32 for a clear summary) but for the purpose of this report the following view is taken: motor development is about the progressive change of an individual's movement behaviour and the systems that support this. 'This perspective offers a non-reliance on stage-like or age dependency viewpoints – it does not allow for

development to be domain specific, but acknowledges that change is both positive and negative throughout life' (Pickup and Price, 2007: 35).

Early childhood sits between infancy and later childhood and acts as a bridge between two well understood phases of life. For example, before the age of four children tend to be very self-absorbed, whereas after the age of seven children are generally sociable beings. This leaves an important transitional phase in between that can impact greatly on children's ability to make progress when they enter later childhood and also ultimately how they develop physically, socially and cognitively as adults.

2.2 Early Childhood Education

In many parts of the UK the period of early childhood bridges the pre-school period and the move to a more formal method of education. Approaches to education between these ages also differ greatly both in terms of location and methods. Doherty and Bailey (2003), building on the work of Bjorkvold (1989), suggest that this as a difficult time for children as they move from a way of being that is active and focused on movement, what Bruner (1983) terms the 'culture of childhood', towards the culture of formal schooling. Indeed it is suggested that, "early years policies and principles collide with what has become known as the government's 'standards agenda' (Alexander et al, 2010, p16). Four year olds in reception classes feel the impact of changes in thinking, changes in policy and ultimately changes in practice. Research reveals that the holistic and balanced early years foundation stage is often distorted by the downward pressure of key stages one and two (Rose, 2009; Alexander et al, 2010).

At the start of this period of development, the primary focus of educational policy is on play (DfES, 2007; Bruce, 2001; Moyles, 2010a; 2010b). The importance of play in the early years is seen as the accepted and central means of early education (Daly, Byers and Taylor, 2006). Despite the dominance of play theory there are those who warn against an over-acceptance of it as being always 'good' (Grieshaber and McArdle, 2010). The point at which this focus on play should move towards a more formal approach to education is also subject of contemporary debate (Alexander et al, 2010) with particular focus on greater transition and an extension of more active, play-based learning.

Young children seem to learn best when they are provided with opportunities for social learning, an element of choice and appropriate responsibility. Essentially, it is suggested that there is a more positive outcome when young children are presented with less formal learning opportunities (Sharp, 1998). Experience prior to school has been shown to be important for all round development, with duration rather than frequency (Sylva et al, 2004) or type of setting (Ofsted, 2009) being significant. Better progress is made where educational and social development are seen as equal and complementary (Sylva et al, 2004). A play based approach is popular with practitioners and is valued by them despite little empirical evidence for the effect on learning and despite the practical difficulties involved in planning learning experiences around play (David, 2003).

The most recent legislation in England within early childhood is outlined in the Early Years Foundation Stage (EYFS) Guidance (DFES, 2007) and in the Key Stage One elements of the National Curriculum (DfEE/QCA, 1999). Markers of quality within Key Stage One (five to seven years) tend to be considered as part of the wider primary school agenda, whilst those relating to younger children are more linked with provision from birth. This report straddles

those two periods and draws from both sets of guidance and practice. In the Early Years much is known about the quality of provision and the expectations as far as practice is concerned. There is perhaps less explicitly understood about approaches to learning and teaching, and quality, within Key Stage One (David, 2003).

Although in general, the period of early childhood is well researched and understood, it is perhaps the range across the phase rather than within the phase that it important. There is very little developmental difference between a five and six year old (Fisher, 2010) but between four and seven there are significant developments. This may explain the difference in approaches to working with children at either end of early childhood but does not make sense of the transitional period in between.

2.3 Physical Education – more than just physical development

The difference in approach to teaching children of different ages, outlined above, can be seen quite clearly when the field of physical education is considered. It is accepted and expected practice for children within primary education to receive lessons in physical education within their weekly timetable. The National Curriculum ((DfEE/QCA, 1999) sets out statutory expectations for these children which are most often covered in set lessons that progress over time. The EYFS (DFES, 2007) has a named area of learning 'Physical Development', which mirrors many of the aims and outcomes of physical education but in many cases this is covered through ongoing activities without a structured timetabled slot. During the transition within early childhood some settings make the move between informal and formal physical education lessons at different times, with Reception (age 4-5) being taught formally in some settings and informally in others.

This difference is also extended beyond practice to approaches to the subject itself. Creating an accepted and shared definition of Physical Education is a complex task (Kirk, 1992; Penney and Glover, 1998). The following definitions share some common features but also demonstrate some of the perspectives that impact on the field of physical education.

> "Physical Education develops pupils' physical competence and confidence, and their ability to use these to perform in a range of activities. It promotes physical skilfulness, physical development and knowledge of the body in action. Physical education provides opportunities for pupils to be creative, competitive and face up to different challenges as individuals and in groups and teams. It promotes positive attitudes towards active and healthy lifestyles. Pupils learn how to think in different ways to suit a variety of creative, competitive and challenging activities. They learn how to plan, perform and evaluate actions, ideas and performances to improve their quality and effectiveness. Through this process pupils discover their aptitudes, abilities and preferences, and make choices about how to get involved in lifelong physical activity"
>
> National Curriculum for England (DfEE/QCA, 1999: 15)

> "The aim of physical education is systematically to develop physical competence so that children are able to move efficiently, effectively and safely and understand what they are doing. The outcome – physical literacy..."
>
> BAALPE, PEAUK, CCPR, PE ITT Network (2005: 8)

> "As appropriate to each individual's endowment, physical literacy can be described as the motivation, confidence, physical competence, knowledge and understanding to maintain physical activity throughout the life course"
>
> Whitehead (2010: 5)

It is easy to see that becoming physically proficient is a part of physical education but it is not the whole picture. There are clearly social, cognitive and emotional factors involved. The view that physical education is a lifelong process (Penney and Jess, 2004; Whitehead, 2010) also makes more pertinent the associations with ongoing child development within overall human development rather than physical education as a subject to be learnt only in school.

In order to achieve the aims set out within the definitions of physical education outlined above, clearly, more than just physical competence or fitness is required. Physical Education involves establishing and changing behaviours, motivation and empowerment and coping with or responding to challenges in a variety of contexts. Children need to have the required mastery of movement skills (Gallahue and Ozmun, 2006; Jess et al, 2006) and a 'functional understanding of movement concepts' (Graham, Holt/Hale and Parker, 2007: 250). Children need to be able to use motor skills in combination with perceptual motor abilities. As children physically grow this changes the body with which they perform these skills. This, in combination with their health-related fitness, impacts on their self-concept in relation to physical education. With the nature of physical education being inherently socially constructed (Hay and Macdonald, 2010) children also need to be able to draw on a wide array of social, cognitive and emotional capabilities.

Physical Education is considered within this report to encompass three main areas of development: physical, cognitive and social development. Although these areas will be considered discretely it is important that the links are made between sections due to the inter-related nature of human movement and child development. For example, co-ordination involves both motor skills development and perceptual development in relation to timing and rhythm. Also, body composition is related to both health related fitness and child growth. Reference will be made between sections of the report to highlight these links.

2.4 Physical Education in Early Childhood Education

A systematic review of early childhood research and practice (BERA EY SIG, 2003) outlined the limited evidence for effective practice within early years' physical development. What research has been undertaken in physical education for children within early childhood focuses on the need for establishing practice that fits within existing practice for early childhood rather than that of existing practice within physical education (Price, 1995; Marsden and Weston, 2007; Zachopolou, Liukkonen, Pickup and Tsangaridou, 2010). This recognises a need for practitioners to understand child development within the context of the field of physical education rather than merely making established physical education 'easier'. This is particularly important if we accept that physical education is more than a preparation for sport or just about physical development. Even if the focus of the subject were only as a preparation for sport, the question would still not necessarily be if children are ready for sport, but more if adults are ready for children's sport (Bailey and Rasmussen, 1996: 196).

This report aims to set out the necessary aspects of early childhood development that need to be understood in order to make sure that practices and policy support the developmental needs

of children. In conjunction with other areas of the overall research project, it can provide guidance as to what should be the practice of physical education for children in early childhood.

In **summary**, there are four key principles that underpin this report. These principles are developed from both background theory in early childhood development as well as the field of physical education.

Key principles

- **'Development is age related but not dependent'** (Gallahue and Ozmun, 2006: 7)
  This means that although age related expectations can act as a guide care needs to be taken that this is not the only factor that is taken into account
- **'Neither nature nor nurture is more or less influential on development'** (Doherty and Hughes, 2010: 24)
  The nature vs. nurture debate has raged for many decades. It is now a widely held view that a combination of the two influences our development. This means that development can be affected by opportunity and that development is not solely pre-determined by genetics
- **'Each child is a person with an individual pattern and timing of growth, as well as individual personality, learning style and family background'** (Bredekamp. 1987: 2)
  Although norms can give an overall picture of how a child can develop they cannot take into account the unique genetic make-up of the individual or the environmental opportunities s/he has experienced.
- **'A class of children is not a homogenous group of learners'** (Fisher, 2010: 17)
  Although it is unlikely that any practitioner will be able to focus solely on individual children they need to be aware that their class or group will contain a dynamic mix of developmental stages and abilities.

3. Expected Progress in Physical Education across Early Childhood

Early Childhood contains many exciting and important developments in a child's overall journey. From the initial excitement of first rolls, the wonder of the first steps and the joy of first words in infancy, it is development during early childhood that begins to set the scene for later life (Gallahue and Ozmun, 2006). This is the time for the 'basics', the building blocks on which a child develops and blossoms. From this early period, the journey towards and beyond puberty and then adulthood is full of surprises, complexity and more excitement.

It is important that when considering the expected progress within early childhood that there is a basic understanding of what comes before and potentially after the period under consideration. Progress and development is not limited by age or any other particular factor in most children and is open to the influence of so many hereditary and environmental factors. The expected progress presented within this section is that expected regardless of gender, ethnicity or socio-economic status. It does not explain all the various delays or changes that may occur due to hereditary factors. It is what is expected for every child who is given the necessary opportunity and experiences to make the most of their potential.

Later sections in this report do outline the current situation that the children in our society today face and how this may be influencing and affecting their progress in relation to these expectations. These will consider variance from the expected pathway and look in more detail at how these factors are inter-related and inter-reliant in many instances.

The transition into early childhood does not occur the moment a child turns four, nor does this period end on the child's eighth birthday. It is suggested by Doherty and Hughes (2009) that it is a generally held view that; if development is viewed as being about the effect of nurture on nature and vice versa then we need to know more than what is expected. Children who are chronologically within early childhood may be developmentally more or less advanced. They may therefore display characteristics of infancy or later childhood. We cannot therefore assume that a child's age will dictate what they can do or are capable of. A brief summary of what is expected before and after early childhood in key areas is summarised below. The summary is based on the review of literature carried out in this study and draws together the underpinning theory and the research included throughout this review:

Table 2: Summary of expected progress in infancy and later childhood

Infancy	Area	Later Childhood
Rapid rate of growth with height, or length, increasing from an average 50cm to 75cm in the first year of life (CGF, 1996). Rate slows but still likely to double birth length by age four. Average weight increase also rapid from 3.5kg at birth to almost three times this age four (9.65kg).	**Growth**	Appears to continue to slow prior to the rapid spurts within puberty. Growth in both height and weight continues but the slower rate allows for a more constant sense of body awareness.
Movement skills development within this period of time enables the infant to begin to interact with their world more effectively. This is done through	**Skill**	If children have successfully mastered the fundamental movement skills then they would begin to apply these into different

a combination of inherent reflexes and developed rudimentary skills (Gallahue and Ozmun, 2006). These movement skills enable children to begin to explore their surroundings (crawl, roll and walk), to maintain postures against gravity (sitting and standing) and to manipulate objects (grasping, releasing and throwing).		situations in what could be termed the specialized movement phase (Gallahue and Ozmun, 2006) or into utilisation or proficiency (Graham, Holt/Hale and Parker, 2007). These link readily to more transferable skills that are more alike to adult movements than before.
Infants will become more adept in interpreting information from their senses as they integrate sensory receptors (sight, hearing and touch most noticeably) and by integrating these with their early experiences and the growing bank of memories. Infants are likely to have developed a sense of body self-awareness within the second year of life (Brownwell, Zerwas and Ramani, 2007) which has implications not only for their understanding of their body parts but also the space they occupy and need.	**Perceptual motor**	Sensory integration with a wider range of experiences coupled with greater cognitive development means that children within later childhood have much more capacity to improve as well as to plan and evaluate. Judgements become more accurate and can take into account a wider range of sensory sources. Responses to stimulus also become more complex and specific in terms of refinement and quality of action. The feedback loop also becomes more developed.
Infants are essentially active and have only basic preferences for what they like and do not like. Although early experiences will have some effect on preference and enjoyment this is more likely to be transient rather than fixed.	**Attitudes**	Attitudes towards physical activity are more established and there are greater links between difference experiences or contexts (Hagger et al, 1997; Carroll and Loumidis, 2001)
Children develop basic processing skills through the use of play, experimentation, copying behaviour and interaction (Doherty and Hughes, 2009). They can attend to more complex tasks as attention span increases and will start to develop a sense of right and wrong (Lane et al. 2010. This will be largely dependent upon the experiences they have and the opportunity they have to engage in the world around them (Beck, 2006). Development of the child cognitively will be linked to the levels of social engagement they have within the first few years of their life.	**Cognitive**	Cognitive development continues to become increasingly complex as children relate their social experiences with more abstract concepts in order to make sense of their rapidly expanding world (Bredekamp, 1974).
Children's development in language will be rapid from birth with thousands of words being learnt	**Language**	Focus moves more on to the use of language rather than language acquisition. This becomes

within the first three years of life (Kameen, 2000). Children will be able to use simple structured sentences to communicate, which will extend to three or four with grammatical markers by the age of three (Iverson, 2000).		increasingly related to articulation of cognitive understanding and expression within social contexts (Bee and Boyd, 2007).
Children will move from being solely egocentric towards enjoying the company of others more towards the end of infancy (Epley, Morewedge and Keysor, 2004). They learn to play with other children more cooperatively and use language to communicate and interact with other people. They become more independent and may show competency in skills such as dressing themselves, going to the toilet and helpfulness (Kameen, 2000). Children are still predominantly egocentric at this age and may still exhibit anger, frustration and resentment.	**Social**	Children in later childhood will have a greater consistency of understanding about friends and the need for social harmony (Doherty and Hughes, 2009). They will begin to have a defined peer group who become increasingly important in how they view the world and themselves (Rothbart, 2007). Children can take into account the views and perspectives of other people and can respond or in some cases manipulate these to their advantage (Howe and Mercer, 2007).
From the development of basic emotions in the early months of life that demonstrate a response to pleasure or withdrawal of pleasure, emotional development enables a more sophisticated interaction with others (Schaffer, 2009) As an awareness of 'self' increases within the second and third year of life, embarrassment, jealousy and empathy can begin. When 'self' is compared to others and norms at this point there is also potential for shame, guilt and an understanding of rules and goals (Beck, 2006).	**Emotional**	Children gain greater control over their emotional responses and develop the ability to hold contrasting and multiple emotions at the same time. They begin to have more balanced and articulated responses within a wider range of response rather than just extremes. They also become much more self-conscious and doubt their abilities and worth (Alexander et al, 2010).

In the following section each of the developmental factors, the physical, the social and the cognitive, are examined to demonstrate the expected developmental pathway within early childhood both in terms of prior understanding and the latest thinking. The information contained in this section forms the basis of the construction of the profiles of 'atypical' children aged four and seven at the end of this section.

3.1 Physical development

3.1.1 Growth

The pattern of growth across childhood until puberty is seen as following a cephalo-caudal and proximo-distal pattern (Maude, 2001). In essence, this means that development starts at the most important parts of the body in relation to early life - the head and trunk – and moves towards the extremities. This makes some sense in terms of the major organs of the body growing and maturing first followed by those parts needed more for investigation and manipulation of the world rather than existence. Factors that influence the rate of growth include genetics as well as other biological elements such as hormonal factors. It is also influenced by nutrition and physical activity (Malina, Bouchard and Bar-Or, 2004).

In early childhood, growth rates tend to begin to slow compared to those in infancy and become steadier in terms of height, weight and proportion. This creates a more stable picture within which to develop control, balance and co-ordination. In relation to **height** children are likely to grow 20cm across the age range. An average four year old will measure 102 cm in height growing to 122 cm by the age of seven. In relation to **weight**, the rate of growth is similar to height matching the same pattern. An average four year old weighs 16kg with an average seven year old weighing 23kg, giving a total weight increase of 7kg (Child Growth Foundation, 1996) [1].

3.1.2 Early Childhood Motor Skill Development

In early childhood, children will focus on developing key movement patterns and skills. Different models refer to this phase with different terminology such as the fundamental movement stage (Gallahue and Ozmun, 2006) or pre-control and control stage (Graham, Holt/Hale and Parker, 2007). These include movement skills such as running, jumping, skipping and climbing (locomotion), throwing, catching, kicking and striking (manipulation) and rolling, landing, twisting and dodging (stability) (Pickup and Price, 2007).

Table 3 below shows a range of selected fundamental movement skills, which can then be developed further to meet the demands of the specialised sport specific skills identified in Table 4 (Pickup and Price, 2007)

[1] All measurement norms are sourced from the Child Growth Foundation (1996) data used in practice by health professionals within England, specifically within the Personal Child Health records given to parents on the birth of their child. The norms are given from the 50th centile of the population.

Table 3: Selected Fundamental Movement Skills

STABILITY	LOCOMOTION	MANIPULATION
1. Axial: **Bending** **Stretching** **Twisting** **Turning** **Swinging** **2. Static & Dynamic (moving) actions:** **Upright balances** **Inverted (or upside-down) balances** **Rolling** **Rocking** **Starting** **Stopping** **Dodging**	**1. Basic:** **Walking** **Jogging** **Running** **Leaping** **Hopping** **Jumping** **2. Combinations:** **Climbing** **Galloping** **Sliding** **Skipping**	**1. Sending or Propelling:** **Object rolling** **Throwing** **Kicking** **Punting** **Striking** **Volleying** **Bouncing** **2. Receiving:** **Trapping** **Catching**

From Pickup and Price (2007, p 80)

Table 4: Selected Specialised Sport-Related Movement Skills

Football skills
Basketball skills
Netball skills
Gymnastic skills
Athletics skills
Dance skills
Striking skills
Swimming skills
Racket skills

From Pickup and Price (2007, p 80)

Regardless of terminology, fundamental skills, movement vocabulary, movement competency etc., a core set of movements are needed for participation in a wide range of physical activities and need a certain level of mastery to be achieved for physical competence. Jess et al (2006) advocate the need for these to be considered as essential within early childhood physical education and there is general agreement that mastering these particular movement skills is relevant and appropriate to the early childhood period. Much of this agreement is due to the suggestion by Seefeldt (1979) that without a basic competence in these movement skills a child will find themselves at a 'proficiency barrier' whereby they would be unable to successfully participate in physical activity. He also suggests that without these movement skills children could not be considered 'ready' for involvement in competitive sport (Seefeldt, 1996).

Mastery for movement skills within early childhood focuses on the gradual refinement of skills from an initial, uncoordinated effort toward a more mature efficient model of movement (Gallahue and Ozmun, 2006). Detailed descriptions from Graham, Holt/Hale and Parker, 2007, Gallahue and Ozmun, (2006) and Maude (2001) amongst others of the components of these skills provide practitioners with examples of how young children should progress in order to maximise the efficiency and effectiveness of their movements. The need for children to develop basic movement competence is a widely held view. It is clear that if children are to develop activity specific movements or even to be able to coordinate movements for everyday life, they must first be able to perform simple and coordinated movements, which can then be developed and adapted to meet whatever demands are to be met. The recognition that we need to learn a series of simple movements, which are then adapted and modified, is the generally accepted viewpoint and links directly to the work of Schmidt (1975) who identified that movements are formed through the development of movement 'schema' which are then utilised and adapted to new situations. Children within early childhood have the potential to reach a mature (or competent) level of skills performance in all of these fundamental movement skills although this relies on positive exposure, experience and feedback (Wulf and Su, 2007). It also requires time and repetition for effective skill learning. There is some suggestion that as younger children do not have an accurate understanding of their own abilities it is only their perception of their ability that is important but Stodden et al (2008) justify the need for actual mastery even at this early stage.

3.1.3 Early Childhood Perceptual-Motor Process Development

The term perceptual-motor process describes the cycle of sensory reception, processing and movement response (Pickup and Price, 2007). It encompasses all aspects of sensation, perception and cognition (Doherty and Hughes, 2009) but within this report it is positioned within the physical rather than cognitive development. This is to emphasise the inter-related nature of all elements of development within early childhood. Although cognition and integration of sensory data with memory clearly sits within discussions of cognitive development, this is reliant on physical sensory organs utilising this data and the body enacting the decisions made before receiving more sensory feedback. Physical and cognitive development is thus intertwined.

Perceptual development occurs at a significant level within infancy but the period of early childhood is also important. For example, key components of visual perception, such as depth -perception and visual-motor co-ordination, go through periods of rapid increase during early childhood but only reach expected maturity in later childhood or adolescence (Gallahue and Ozmun, 2006). Early childhood offers opportunities for development due to the steady growth rate and increased access to experiences. As children in this period are still growing and developing their sensory organs are not fully formed (Pickup and Price, 2007) which make sense as to why the physical component of this area is still ongoing. Children also need varied and frequent movement experiences to stimulate their perceptual-motor development (Doherty and Hughes, 2009), which again becomes more prevalent within this period of life as children develop more independence and interact with the wider world. This again raises debates around nature or nurture in child development and there are many areas of perceptual-motor process development that are not yet agreed upon.

An example of where a consensus view is not yet available is the extent to which perceptual-motor development is reliant on movement 'it is probably safe to say that movement is a

"sufficient" condition for encouraging development of perceptual abilities, but whether it is a "necessary" condition is doubtful' (Gallahue and Ozmun, 2006: 262). Children need to have sensory experiences to be able to build up a sensory memory with which to base decisions on. The more experiences that can be drawn from in terms of sensory data and feedback, the more likely a more refined response can be chosen and enacted. The accuracy of sensory feedback that children receive alongside other forms of feedback will enhance their learning and progress (Sharp, 1992; Galligan et al, 2000).

Within early childhood, perceptual-motor development is categorised into four areas: body, spatial, directional and temporal awareness (Pickup and Price, 2007). Expected development in this area across this period would be characterised through the following developments. In terms of body awareness children move from understanding what their body is and is called, to a position where they understand what they can do, and with feedback and opportunity, what is possible and desirable for effectiveness. This links with what Gallahue and Ozmun (2006) describe as children's growing ability to refine their movement skills at this stage of their development. These views relating to the need for opportunity to do, and the importance of feedback, are widely held. The importance of immediate and accurate feedback is agreed although there is not always consensus about how much opportunity to perform is needed.

Given a range of opportunities, children will develop their spatial awareness from being purely about objects in relation to themselves, to a more objective reference point. This mirrors the development of a greater awareness of others in a social context and can be seen in terms of language, awareness of our position in our society as well as in actual movements (Roncessalles et al, 2005). Directional awareness may also become more refined within the early childhood period, both in terms of internal laterality and external directionality (Pickup and Price, 2007). It is important that by the end of early childhood, children have a secure understanding of direction not only for physical activity participation but also in terms of reading and writing. Temporal awareness is also seen to develop over early childhood with greater coordination, sequencing and rhythm developing with greater exposure to experiences and multi-sensory feedback (Pollatou et al, 2005). Temporal awareness, or timing, is a key marker of efficient and confident performance. This timing is in relation to coordination of the movement components themselves (between body parts) and the movement as a whole in relation to a stimulus (space, direction or rhythm).

Perceptual-motor development has been shown to help children to become more coordinated and efficient in their movement, as well as becoming more adaptable and creative (Jess and Collins, 2003; Jess, Dewar and Fraser, 2004). Environmental constraints are most often associated with any 'lag' in development (Gallahue and Ozmun, 2006) and many children demonstrate problems with making expected progress in this area (Cheatum and Hammond, 2000).

The link between the physical and cognitive domains is clearly demonstrated within perceptual-motor development. Input, integration and output occur through a combination of physical and cognitive processes, each is dependent on the other if effective and appropriate actions are to take place. The areas of perceptual output such as speech and language will be discussed within the section 3.3 where other aspects of cognitive development are discussed.

3.2 Social Development

Although some physical activities can be completed without the need for another person, Physical Education is inherently a social activity. Many of the perceived benefits of the subject can only really be realised within a social environment although this is not wholly necessary. The ability to understand oneself and how this understanding of our position in society relates to others is part of the process of physical education and therefore an understanding of this area is also necessary to truly understand child development across this age phase in this field.

3.2.1 Emotions and self esteem

Social and emotional development can be seen as the development of emotions; self esteem and communication (see Dorman and Doman, 2002) or as Schaffer (2009) describes it, the process of 'becoming human'. This is where children start to acquire the beliefs, behaviours and values deemed significant by other members of society (Schaffer, 2009) and whereby they develop the relationships with other people and closer attachments to adults, family and friends. This process involves socialisation into the norms, values and beliefs of society.

Having identified the important role of socialisation, it is important to recognize that still prevailing among many social researchers are the continuing discourses around nature and nurture and its influences on children's personality. Plomin (2004) still maintains that hereditary factors play a strong link role in the determination of personality and must be taken into account for the many differences that prevail amongst individuals. Critiques of a biological perspective have questioned this approach in line with a developmental argument as a biological perspective cannot give reason to the temperament of the child and the effect the environment plays on the development of personality. In other words, a biological perspective does not address how the shared developmental patterns may interact with inborn individual differences (Bee and Boyd, 2007). Temperament, according to Rothbart (2007), describes the initial state from which personality develops and links to individual differences and can be thought of as a matrix of core qualities that are apparent in infancy and can inform a child's later personality (Doherty and Hughes, 2009). Rothbart (2007) suggests that it is temperament and experience that together will 'grow' a child's personality, which will include the child's developing understanding of self, others and the world around them.

The social development of the child is a complex process, which is influenced by many factors. While family members have the greatest impact on the lives of babies and very young children it does not take long for the outside world to begin to have an influence. The social development of children will be influenced by factors that are out of the control of parents, either positively or negatively and school and the teacher will become a major contributing factor. Theories over the last 50 years recognise the influence of the socialisation process and the role played by others in helping children become socialised into the world. Children who are encouraged and commended by parents and teachers develop a feeling of competence and belief in their skills. Those who receive little or no encouragement from parents, teachers, or peers will doubt their ability to be successful.

3.2.2 Stages of Development

As discussed earlier, up until the age of 7 the child is in what Piaget called the pre-operational period. Piaget suggested that this can be broken into two phases; ages 2-4 years old he called the pre-operational phase and ages 4-7 the intuitive phase. During this period the child will initially demonstrate egocentric behaviours although as they develop they will begin to be less egocentric and will begin to understand the place of others and will begin to be able to modify their actions based on that increased awareness. Erikson suggests that the move away from

egocentricity occurs earlier than Piaget although both argue that this will generally occur as the child reaches the age of approximately 6.

Development of the social self is complex and between the ages of 4 and 7 children will recognise differences in what they and their peers can and cannot do. How a child views his/her self in relation to others is often termed 'self-esteem' and this is generally agreed to be unstable within early childhood. 'Self –esteem is changeable and unseen; we can only observe the effects in emotional response, attitude and actions – all children begin with high self esteem it is only their interactions with others that contribute to whether or not self-esteem is encouraged or diminished' (Kamen, 2000: 172). As young children have less accurate perceptions of their own abilities, the role of practitioners is important in mediating actual and perceived competence. Young children rely on feedback from external 'others' until later childhood with teachers appearing better predictors of low perceptions of competence than either actual low skill or high BMI and parents as better predictors of actual low motor skill (Toftegaard-Stoeckel et al, 2010).

3.2.3 Helping children to develop a robust self esteem

Helping children understand the outcomes of their actions and attributing reasons for success and failure in the physical world is an essential element in ensuring future motivation and persistence in mastering an activity. Weiner (1974), the father of Attribution Theory, identified the importance of 'training' individuals to attribute outcomes to appropriate factors when considering the impact on motivation. Attributional training requires clear understanding of how a child views his/her performance and how correctly attributing reasons for success or the lack of it can result in future successes. Before the age of 4 and even beyond, as mentioned previously, children see that what happens around them in terms of themselves. They will see the results of their actions solely in terms of their influence and the impact on them. As they become less egocentric, children between the ages of 4 and 7 and beyond will recognise how other factors influence what they do and how they do it. The 'locus of control' and the 'locus of causality' are important aspects for continued motivation. If a child successfully masters a particular movement it is important to help them to attribute the successful outcome to internal and stable factors. In other words, to see success as something they were responsible for and that will happen again. Internal factors would include the degree of effort used (you did well because your tried hard) and personal ability (you managed to do it because you are good at it). The opposite is also true, that is that if a child is struggling to master a skill/concept, attribution of external and unstable factors will help future motivation and success. Unstable factors are those which will change the next time the child attempts the activity, such as luck and external factors are beyond the control of the child (it's not their fault) such as the difficulty of the task or again luck (Weiner, 1974; Martin and Dowson, 2009).

When learning about how to work with others, and all that this entails, children should be encouraged to pursue joint goals and explain their understanding while expressing different points of view. This way they can learn to reach a consensus through discussion that will help learning (Howe and Mercer, 2007). This needs to be the focus of the learning opportunity so that they can put aside any differences to achieve a common and fulfilling goal. Some children in early childhood adapt well to the view of the 'bigger picture' others focus on their own actions and the results they personally achieve.

3.2.4 Personality, Attitudes and Behaviour

The personality of the child and adult is seen to be a key player in the behaviour and attitudes of the individual (Slobdskaya, 2007). Personality is the term used to refer to the differences in the ways in which people relate to objects or other people around them (Doherty and Hughes 2009: 366). Researchers in the field of psychology largely accept five main personality traits in adults, which are believed to be stable over longitudinal studies (Thurstone, 1934, John et al, 1994; Hong et al, 2008). There is evidence to now to suggest that these traits are also apparent and stable in childhood (Slobdskaya, 2007). These five traits are extroversion, conscienscousness, agreeableness, neuroticism and openness. Work by Prinzie and Dekovic (2008) into personality and individual difference of children (aged 6 – 9 years) points towards a picture of consistency across the five personality traits being present in childhood. However over the three year period of research, small mean changes were reported. There was a small decrease in extroversion and imagination. There were also mean decreases found in optimism, expressiveness, energy and motivation.

The bridge between the self and others is often expressed in terms of emotional response and in early childhood these develop rapidly and form an integral part of the child's daily life and are built predominantly around social interactions (Doherty and Hughes, 2009: 337). In early childhood these move beyond the outbursts of laughter or tears of infancy and become more complex. This is through both a greater appreciation for what others are feeling as well as a better understanding of cause and consequence (Doherty and Hughes, 2009:249).

Theorists advocating a social learning approach would emphasise the interactions that a child has with the environment account predominantly for a child's emotional development. For example, if a parent's, teacher's, or sibling's response to a situation is fear, the child will later respond in that way. Although a child's physical and cognitive self may be developing at a fast rate, the social and emotional self may not be developing at the same rate. It is quite normal that a child slows down in one area of development (say the social or cognitive) as it is making faster progress in the physical.

3.3 Cognitive development

For children to be considered physically educated they need to be able to do more than perform physical skills or develop certain attributes. Physical education is an active process throughout which children can understand about movement, as well as learn to move and move to learn (Arnold, 1979; 1988) and continues to be considered as a contributing factor to cognitive development (Baalpe, et al, 2005; Bailey et al, 2006) This process is beyond purely physical development and requires a consideration of the cognitive developments that make this process occur effectively.

Cognition can be understood as connection with thinking or a conscious mental process (Dorman and Dorman, 2002). It is the extent to which we can make these processes and connections that distinguish us from animals and therefore makes being human unique. Within this definition cognitive development makes reference to any inner processes of the mind in tasks that include for example; planning, reasoning, creating, fantasising, problem solving, rationalising and categorising, problem solving, language use and engagement in the five senses (see Beck, 2006 and Dorman and Dorman, 2002).

While we understand the development of cognitive abilities to be linear (Beck, 2006) the progression through developing the set of cognitive skills may be achieved at faster rates for some children, than others. Recognition must also be made that there will also be different individual differences at each stage.

Over the last decade, there has been growing support for the view that there is a "critical" period for brain development from birth through the early years of childhood (Wynder, 1998). Both genetics and environment are likely to be important determinants of brain development (Kotulak, 1998). Children's cognitive development follows the same principles as other areas of child development as children need experience to make sense of what they find out through their senses. Learning is inextricably linked to cognitive development as it will affect one or all of the cognitive processes. Cognitive development requires interaction between biological, social, emotional and intellectual factors and relies on linguistic and social interaction with practitioners, parents and other children (Alexander et al, 2010).

3.3.1 Stages of Cognitive development

Many theorists have attempted to understand children's cognitive development through hitting chronological milestones suggesting that at certain age benchmarks, certain behaviours can be expected. Perhaps some of the most well known and understood theories are those of Piaget's who placed children at the heart of the construction of their own learning and development and that the role of maturation played a significant role in a child's increasing capacity to understand the world (Fisher, 2010). Piaget's theory of cognitive development is represented through the unfolding of four stages, sensorimotor stage (birth – 2 years), pre – operational stage (2 – 7 years), concrete operational stage (7 – 11 years) and formal operational stage (12 years upwards). Beck (2006) identifies a number of contrasting views to those put forward by Piaget, for example Vygotsky suggested that children are not born as cognitive beings but develop these capacities through physical and perceptual engagement.

The stage we are concerned with in this report fits into the pre-operational stage. This stage of cognitive development is associated with the early childhood phase, whereby children will develop their understanding of the world through increased mental representation. They will use symbols to represent their understanding through the presentation of language, drawings, and play scenarios. Allowing for experimentation, exploration and role play are all considered good practice within educational based early year's settings (Doherty and Hughes, 2009).

The range of opportunities, stimulation and involvement children are presented within this preoperational stage will have a huge impact on the rate of a child's overall development (Beck, 2006). It is difficult to isolate cognition from other aspects of child development as it is inextricably linked with the child's engagement with the physical world, social and emotional self and successful interaction. This requires children to understand that not everyone interprets the world in the same way as they do (Epley, Morewedge and Keysor, 2004). Children younger than four do not distinguish between what they know and others know and therefore their interactions with the world around them will be more egocentric than older children or adults. Children may perceive the world in this way due to the lack of knowledge of physical causes and effect. Development of this will start to appear towards the end of early childhood. (Epley, Morewedge and Keysar, 2004).

This egocentric approach to interaction can cause social situations to be challenging for children, because of their belief that their perception of the world is

accurate. Miscommunication and difficulties in understanding how other people think can often lead to conflict amongst other children and adults when this has been failed to be recognised. Egocentrism is not something that a child will grow out of with age, more that it is overcome each time they attempt to adopt another person's perspective (Epley et al, 2004). The implications for this are that children will need to have exposure to a plethora of different social interactions and people in order for them to develop different perspectives and empathy.

From as early as four years old, children can start to respond to social norms in their reasoning and thinking and as early as three begin to understand the differences in their thinking between right and wrong or goodness and badness (see Lane at al. 2010) but adaptation to their thinking will only come through exposure to various contexts and situations.
Much of the literature indicates that there is generally a spurt in cognitive development around the age of 7. Therefore towards the end of early childhood, children begin to:

- think more logically and can also think in more abstract ways (Bredekamp, 1974)
- become more literate (Robinson , 2008)
- Start to understand opposite concepts such as near, far, short long, sharp and blunt (Robinson, 2008)
- Constantly wish to seek validation and approval from them and their peers (Robinson, 2008) and become more cooperative within the increasing complexity of challenges (such as in games with rule observance)

Children's sensory motor activity continues to play an important and functional role in cognitive development within early childhood, as children start to interact with objects, people and places they will start to develop the language and cognitive processing abilities that are required through this engagement (Bee and Boyd, 2007). It may be visible though this type of interaction, children will vocalize what they are doing. The significance of speech in relation to cognitive development can be sometimes represented through the child's use of this self-directed or internalised speech. This will be particularly apparent in activities or contexts that are new or unfamiliar to them. Talking through what they are doing helps develop the child's confidence and strengthen whatever cognitive domain the activity is challenging (problem solving, reasoning, fantasizing etc.). As children become more confident in what they are doing or take part in more familiar activities this speech becomes more internalised and may become less apparent to the adult. The use of self directed speech however is not necessarily an indicator of poor cognitive development, in fact it could evidence high engagement and involvement with the task the child is undertaking and shows the willingness of the child to improve the performance of what they are doing (Iverson, 2010). The implications which can be drawn from the work of those identified above appear to suggest that educators should present children with opportunities to feel comfortable speaking aloud and clearly vocalising what they are doing and how they are accomplishing what they are doing.

3.3.2 Language: a bridge between cognitive and social development

When discussing cognitive development it also important to recognize the child's development in language. However, although it is widely accepted that language can be used as a powerful source for cognitive development, it is not a sole indicator.

Early language theorists believed that children develop language through imitating others, however critics of this view have argued that this cannot explain on its own how children create words and sounds, which have not come from imitation (Bee and Boyd, 2007). Therefore imitation has a place in children's language development but cannot be considered a sole determinant. Environment has been recognised to have a large effect on the child's development of language. Snow (1997) found that four year old children reared in poverty use shorter and less complex sentences compared to their more affluent peers. While being affluent or poor will not directly affect a child's ability to develop language, poverty and wealth can be strong indicators of education and status of the family. With regards to the rate of which language is developed, researchers have identified that those parents who speak and read more to their children help them to develop larger vocabularies and as a result they become more competent in using complex sentences (from Iverson, 2010, Bee and Boyd, 2007 Snow, 1997 and others).

It is therefore clear that although quantity of speech is important, the impact of richness and quality of the language should also be recognised as important. Adults often speak to infants in a simplified, slower and higher pitch (known as motherese or infant – directed speech). Children from an early age can often distinguish between adults and infant directed speech and this approach can be effective when words and phrases are repeated or when grammatical inaccuracies are corrected.

3.3.3 Language and the physical self

There is strong empirical evidence to suggest that there is a relationship between motor development milestones and language milestones, however this is a complex and multifaceted (Iverson, 2010). While language development is not directly related to motor development, due to the participatory nature of motor development, there is strong evidence to suggest that the acquisition of motor skills provides infants and children with opportunities to practice skills relevant to language acquisition (Iverson, 2010). It is also believed that the emergence of new motor skills changes children and infants experiences with object, people and their own bodies in ways that are relevant for both general communicative development and the development of language.

From the wealth of literature in this area it could be argued that educators working with children in the physical education domain need to provide opportunities for young children to develop motor skills as the application of these skills will in turn affect the opportunities for language development as they engage with objects, places and people. It is important to note, however, that slow progress in motor achievement does not necessarily imply that language will develop as a similarly slow rate. The reverse can also be said that slow development of language does not necessarily mean that a child's motor development will also be adversely affected. The continuation of language development beyond the first two years of life, as the developing motor system, provides children with opportunity to practice and refine skills that are crucial for language and meaning making.

3.3.4 Language Milestones

The word 'language' is often used to describe the process of speaking and listening. Humans are social beings who need to be able to interact with others; therefore language also plays a key part in a child's social development as a way to help make sense of the world around her/him. It is perhaps more accurate to refer to language milestones as sequences rather than stages as the development of language is not fixed to a particular age or developed in a fixed

way for every child (Kameen, 2000). Sequential development however alludes to a basic pattern that the child will follow in order to develop thought, non – verbal, verbal, reading listening, writing and speaking skills. At 4 – 5 years old, children may exhibit a vocabulary of approximately 2000 words. They start to become inquisitive through the use of their language. asking why, when, how, where and who questions. They start to vocalise thoughts and feelings rather than demonstrate them through gesture alone and will show interest in songs, rhymes, poetry and stories as they will begin to understand more complex verbal messages.

Between the ages of 5 – 7 their vocabulary may have extended up to 7,000 words and skills, in reading and writing will also be developed. Reading maybe more advanced at this stage than writing. They can form more complex sentences and recall/verbalise past events including, songs, stories or poetry they have enjoyed. Children in this stage of early childhood will be able to listen and follow instructions as well as start to use humour intentionally within their communication for emotional responses (Kameen, 2000).

4. Summary of Expected Progress: an atypical child

It is proposed that due to the developmental principles set out in section 1 and 2 of this report, there is no such thing as a typical child. A typical child is a **different** child. Therefore the children presented below form an atypical picture of expectations. Generalisations can be drawn from these portraits with the understanding that they do not give the whole picture.

Table 5: Profile of an atypical child aged four and seven

An atypical 4 year old	Area	An atypical 7 year old
One metre tall and weigh 16kg	**Size**	One hundred and fifteen centimetres tall and weigh 23kg
Entering a period of steady growth increase from rapid rate in infancy	**Rate of growth**	In a sustained period of steady growth until puberty
Entering the fundamental movement stage of movement skill development	**Movement skill development**	Gaining mastery in a range of fundamental movement skills with the potential for progress into specialised movement skills
Unable to accurately rate their own level of performance	**Perceptions of ability**	More accurate at judging their levels of competence but still needing guidance
Early Years Foundation stage provision within play based pre-school environment	**Education**	National curriculum provision within formal school setting
Limited formal opportunities for progressive physical education	**Physical Education**	Takes part in at least two hours of physical education per week in school and is likely to participate in at least one hour per week more beyond the curriculum
Mainly egocentric but with a growing understanding of others	**Social development**	More aware of social comparison and beginning to seek out opportunities to test this. Able to work with another child rather than just alongside
Emotionally unstable, prone to extremes of confidence	**Emotional development**	Beginning to manage contrasting emotions at one time
Beginning to understand basic concepts of cause and effect	**Cognitive development**	Linking concepts across different areas of learning
Using language more to understand and communicate	**Language development**	Using language effectively to communicate and explain

The challenge for the teacher and anyone working with children is to understand difference and to cater for the different needs of every child. We must understand where the child is in terms of their development before we decide what we can do to encourage and enhance development.

5. Do children in today's society make expected progress?

From the previous sections in this report it is clear to see that child development in relation to physical education within early childhood is complex and multifaceted. To analyse how children progress against each individual component would not necessarily give a picture of how they progress against the overall aims of the area in focus. The aim of physical education within early childhood is to engage children with, and prepare children for, participation in physical activity so that they can maintain a healthy lifestyle (National Curriculum (DfEE/QCA, 1999); EYFS (DfES, 2001)).

This section of the report presents a picture of where children in England are currently positioned within the ranges of expected progress. This is in relation to:

- Participation in overall physical activity towards recommended levels
- Participation in physical education and sport
- Levels of physical skill

This presents a picture of how children today are progressing cumulatively before factors that enhance or limit progress are outlined in the later sections of the report.

5.1 Participation in physical activity

Within the United Kingdom, there are national physical activity recommendations (HEA, 1998; Jess et al, 2006). These match those in other countries such as America (NASPE, 2002) and Global recommendations on Physical Activity for Health (World Health Organization (WHO), 2010) which stipulate that children should accumulate at least one hour of age-appropriate physical activity per day. The recommendations go even further, suggesting that this activity should be in bouts of at least fifteen minutes and should not be interspersed by periods of inactivity longer than two hours within daytime hours (WHO, 2010).

If children meet the recommended daily guideline then it has been documented that they will experience positive health benefits relating to bone health (Kemper, 2000; McKelvie, Kahn and McKay, 2000); psychological health (Sallis, 2000a) and in the development of brain and perceptual motor process (NASPE, 2002; Haywood and Getchell, 2004). It also reduces the risk factors for heart and circulatory diseases (Scottish Executive, 2003).

Childhood, as a whole, is becoming more about inactivity than activity. A recent British Heart Foundation Report (2009) points to some startling figures with levels of sedentary behaviour in children in early childhood around 75% of monitored time and with television viewing accounting for nearly 50% of this time on weekdays. In terms of actual physical activity around 17% of children in England not even getting thirty minutes per day despite recommendations of double this.

Physical activity levels decline with age (Sallis, 2000b) therefore the need to embed good patterns of physical activity from an early age is essential. Based on the literature reviewed, studies have explored physical health positive effects in preschool children where physical activity levels have increased by 30 minutes per day. Within these studies, it showed however that there was little impact on adiposity but there may have been improved aerobic fitness. In terms of psychosocial development, studies have indicated that even as little as 20 minutes of aerobic activity per day may improve a child's self esteem. This however will depend on the

quality and appropriateness of the motor development activity the child is engaging in and the environment in which it is set (British Heart Foundation, 2009).

Children are physical beings who enjoy physical movement and who have a basic human right to engage in play and activity. However the assumption that all children under five years old are physically active may have led to the lack of detailed research into the health benefits surrounding physical activity levels with the early childhood age group (Timmons, Naylor and Pfeiffer, 2007).

Children live in an increasingly technological and digital age where computers, DVDs, televisions, transportation by car and many other labour saving devices are a regular part of life. Not only that, but these are built into the world children now live and they have no reference to a time without these things. Although these innovations have many benefits, the functional physical activity of most people is now much less than it once was and has resulted in today's children expending approximately 600 kcal of energy ***less*** per day than their counterparts 50 years ago (Boreham and Riddoch, 2001).

In relation to this key health related outcome of Physical Education children are generally not meeting guidelines with studies reporting between 65% (children between 5-11, NHS, 2006) and 2.5% (children age 11, Riddoch et al, 2007) of children participate in recommended levels. It has also been demonstrated that childhood inactivity tracks into later life (BHF, 2009, Jess et al, 2006). It should be recognised here that the path into activity is by no means certain but that the studies cited above suggest there is a likely link with childhood and adult inactivity.

5.2 Participation in Physical Education

Participation in physical education can have many benefits for children (Bailey et al, 2009). Specifically, for young children, it has been shown that it can improve fundamental movement skills (Iivonen et al, 2009) and physical activity levels even when integrated within existing informal provision (Trost et al, 2008). Physical Education can also provide some children with their only statutory access to physical activity (Pickup and Price, 2007).

Since the academic year 2004/5 the proportion of children aged five to seven taking part in at least two hours per week of physical education has increased from just over fifty percent to ninety-five percent in 2007/8. The data on which these figures are based is a result of schools reporting their own position and the validity of the data might be questioned, however there would appear to be a trend towards an increase in participation. The data presented and anecdotal evidence suggests that the average amount of curricular physical education has increased from just over an hour and a half to just over two hours within the same time period and has been sustained since 2007/8. Although the data is not directly comparable, (PESSCL 2009 and 2010) it can be suggested that around fifty percent of children participate in at least an hour beyond this baseline of two hours. This is behind the participation rates for children in later primary education but the increase in trend is promising.

5.3 Participation in Sport

Access to provision of physical activity beyond curricular physical education can often come in the form of participation in organised sports and competition. Since 2007/8 it is reported that about a third of children aged between five and seven participate in community sport, dance or physical activity clubs during the week that are linked to their schools (Quick et al, 2009; Quick et al, 2010).

In relation to competitive sport recent data suggests that there has been an increase in the percentage of children aged between the ages of five and seven participating in intra-school sport. For children at the end of early childhood this figure has risen from 52% to 72% between 2007/8 and 2009/10 (Quick et al, 2009; Quick et al, 2010). Data on regular participation (more than three times per year) is not available for children within early childhood, but extrapolating the trend within later childhood it can be predicted that it would be less than 47% of children aged seven-eight.

In relation to inter-school sport the trend is similar with an increase in participation from 26-48% of children age five-six from 2007/8 to 2009/10 and from 39-57% in children aged six-seven (Quick et al, 2009; Quick et al, 2010). Again regular participation data (more than three times per year) is not available but it can be suggested that it would be less than the 16% reported within seven/eight year olds. The gathering of data relating to activity levels and participation is key to identifying trends. At present much of the data is produced annually by schools as they report back on the PESSYP strategy. The validity of this reporting process might be questioned as the results impact on future funding. It would be useful to identify trends and future requirements if this data were to be gathered independently to provide a clear picture about what children do and what might have a positive impact on participation.

5.4 Are children skilful enough to participate?

Despite the focus on the mastery of fundamental movement skills there is little data available in the UK focusing on actual achievement of these skills. More work has been carried out in Australia which points to a concerning trend that children towards the end of early childhood are yet to pass through the 'proficiency barrier' in a many of these fundamental skills (van Beurden et al, 2002; Okely and Booth, 2004). This means that they are yet to have acquired or mastered the basic movement skills necessary for successful participation in physical activity, physical education and sport.

The focus on movement skills development has particular importance when considered in relation to physical activity participation. Research suggests that even within early childhood motor skill proficiency levels are a predictor of physical activity levels (Raudsepp and Pall, 2006; Williams et al 2008). Numerous studies also point to a predicted link between skill competence and perceptions of competence in childhood and fitness in adolescence (Barnett et al, 2008; Barnett et al, 2008). The need for movement skill mastery and physical activity beyond early childhood is also seen to remain throughout childhood (Wrotniak et al, 2006). Low movement competence appears to track over time from early childhood and links with a sustained pattern of lower fitness and skill than more physically capable peers (Hands, 2008). It is also important to note that it is widely agreed, and has been for a long time, that children who are considered physically 'clumsy' in early childhood continue to have social, emotional and educational problems into adolescence (Jess et al, 2006, Skinner and Piek, 2001, Cantell, 1994, Kalverboer et al, 1990, Shaw et al 1982).

5.5 What might be an outcome of low physical activity participation?

Within a global culture where individuals are wealthier, healthier and more privileged than ever before but where children are growing increasingly unhappy (Palmer, 2006) implications of health are growing ever more important. Poor health is not something which is exclusive to adults or children in later childhood; in fact the implication for having poor health in the early childhood can have drastic implications for the onset of health related issues in adult life. There are many factors that contribute to a child's overall health but the most important in relation to this report is physical activity.

It is believed that 'regular physical activity does not solely alter the processes of growth and maturation, but it is does play a factor in the regulation of bodyweight and in particular fatness' (Malina et al, 2004: 504). A lack of physical activity is linked with many disadvantages in terms of child health but the most prevalent in terms of policy and rhetoric associated with physical activity, physical education and sport is that of overweight and obesity.

In the UK, the number of overweight and obese children has been on the increase for the past twenty years (Chinn and Rona, 2001; Gately, 2007). Currently the main measure is by Body Mass Index (BMI), although this is not accepted by all as being an accurate predictor of ill-health due to fatness. Studies have shown little difference between levels of obesity reported by this method or others (Reilly et al, 2010). Normative and distributional curves have been established (Cole et al, 1995; Cole et al, 2000) that can give an idea as to the overall picture of prevalence.

The **current picture** of early childhood overweight and obesity is:

- In 2008/9 22.8% of children within the Reception year (aged 4-5) in England were classed as overweight (13.2%) or obese (9.6%). There have been no significant changes in these figures in the three preceding years of data from the National Child Measurement Programme (NHS, 2010)
- Prevalence of childhood overweight and obesity increases between early and later childhood (NHS, 2010)
- Obesity is now the most common disease of childhood (Reilly, 2006 cited in Birch, 2009).
- In England, 16% of children aged between 2 – 15 years were classed as obese in 2006 and in total it is believed that 4.5 million children in the UK as a whole were said to be overweight or obese (Birch, 2009)
- Jeffery, Voss, Metcalf, Alba and Wilkin (2005) advocate that overweight goes largely unrecognised as parents are poor at identifying when they themselves and their children are overweight.
- Relationship between social class and obesity has been lost and is no longer the strong indicator that it used to be.
- The implications for children who are obese are: increased risk of cardiovascular diseases elevated blood lipids, increased blood pressure, insulin resistance leading to development of type 2 diabetes, poor immune function (Must and Strauss, 1999) as well as psychological complication with social acceptance, social alienation and low self esteem (Dietz et al, 1998).
- A child who is obese in early childhood has a 5 fold increased risk for a poor health related quality of life (Schwimmer, Burwinkle and Varni, 2003) and that obesity in childhood is a leading cause of health problems in adult life (Nader et al, 2006).

- The determinants of obesity are complex and wide ranging but the following factors are considered to be the predominant influential determining factors: biology, food production and consumption, societal influences, individual psychology, individual activity and activity environment (Finegood, Merth and Rutter, 2009)
- It is not enough to merely prevent obesity in childhood through a short term increased activity or reduce calorific intake (although this will result in a better energy balance in the short term). It must take place through a change in all spheres of the child's influence and be embedded in their attitudes and understanding.
- Children who increase in body fat earlier (after initial increases and decreases in the first few years of life) in what is termed the 'adiposity rebound' have an increased risk of obesity in later life (Dietz, 1994)
- If a child is overweight before early childhood or experiences greater rates of growth in weight during infancy they are more likely to become overweight in later life (Baird et al, 2005)
- Patterns of being overweight or obese in early childhood may seem too early to worry about but there is growing evidence that patterns established in the early years not only track from overweight into obese (Reilly et al, 2010) but for children with overweight parents into later life (Wright et al, 2010). It is also of concern that obesity is already linked to depression in girls just beyond early childhood (Erickson et al, 2000)

Childhood obesity and physical education is a research area that has developed in recent years. Significant work has been developed in terms of obesity management (Gately, 2007), obesity and physical education practices (Harris and Cale, 2007) and the dangers of limiting health promotion discourses to just obesity and weight management (Evans, Rich and Davies, 2008). Much of this work has focused on physical education for older children and adolescents but the key messages are relevant. Recommendations linking to physical activity participation and establishing positive attitudes and motivation towards physical activity are suggested. The importance of a holistic view of individuals as well as an inter-related approach is advocated within this research field, which sits comfortably with the key messages within this report.

In summary, most children in early childhood are less active than recommended, do not all participate in a range of physical activities beyond compulsory opportunities and are not as physically skilful as they could be by this stage of development. There are a growing percentage of children for whom this means that they are not only inactive but becoming increasingly overweight which will have negative health consequences. The next section of this report seeks to explain some of the reasons why this is the case.

6. Why do young children not make the expected progress?

From the picture described within the previous section, many children in England in 2010 are not or have not made the progress expected of them in terms of physical education. As has been the case throughout this report, it is not a simple task to demonstrate exactly where the problems and barriers lie. Some determinants are the same as for any other area of child development, such as birth weight, diet, social class and gender; others are more particular to this field, for example opportunity and guidance. It could be assumed that physical development is the key to physical education but even this remains unclear.

As set out in the introduction, children may not meet expected progress rates for a number of reasons. This may be due to the presence of rate limiters – barriers to development, or the absence of affordances (Gallahue and Ozmun, 2006). Although participation in physical activity is a fundamental concern, the actual physical activities themselves are neutral in terms of their effect on children. No particular activity is necessarily better, although it may be more appropriate. It is the perception of the experience that makes it potentially positive or negative (Fox, 1988). These aspects are not only biological. Any genetic predisposition is 'mediated by a wide range of other factors' (Armstrong and Welsman, 1997: 245). Indeed, 'there is little evidence to suggest that readiness to learn specific motor skills can be identified through a combination of chronological age, body size, or the various assessments of biological maturation' (Seefeldt, 1996: 55).

Where children do not meet with expectations of progress, this may be due to a number of discrete or, more likely, complex combination of inter-related factors. These will have both hereditary and environmental influences. The statement 'all children are different' is somewhat of an over simplification, but this is the reality. Another reality is that practitioners cannot deal with individual differences effectively within a large group situation. Given the number and range of factors that affect development, from genetic pairings to specific feedback between individuals it is perhaps similarities that we should try to explain rather than differences. There are, however, particular groups or sub-groups of society that are usually considered 'at risk' from not meeting expected progressions, again for a number of reasons.

It is important that while an understanding of the diverse nature of society is vital to appreciating the different needs of groups and individuals this is not accepted as unavoidable or pre-determined. With a greater understanding of limiting factors for particular groups, more can be done for and by those groups to increase possibility and opportunity. The following information should not serve to undermine individuality, assume potential or limit opportunity.

Concerns have been raised (Nurse, 2009) about the lack of reference to context and culture in the development of motor development norms. If the view that nature and nurture have combined effect on development then it suggests that normal motor development should not exist beyond the culture or society being considered. It should therefore mean that we must acknowledge the multi-cultural nature of society when considering what the norm is and also that to be the 'norm' is usually to be 'different'.

It is also important to consider which factors are readily modifiable and which are beyond the control of most individuals or practitioners working to support children. For example, there is little that can be safely done to control when a child is born or to delay birthing processes once they have started. It is known that significantly pre-term babies have lower height, weight, BMI

and head circumferences aged seven than full-term babies. They also perform less well in cognitive tests relating to visual-motor integration and movement skill performance (Cooke and Foulder-Hughes, 2003). This study highlights the importance of measures which can be put in place to support pre-term babies more if they are to be given the best start in life

Similarly, physical growth is a factor over which, beyond nutritional factors, it is difficult to limit or enhance opportunity. The potential range of heights of children of the same chronological age within early childhood is between twenty and thirty centimetres. The range of potential weight difference between two children in early childhood is between ten and twenty kilograms (Child Growth Foundation, 1996). The implications of these size differences are potentially significant when considering physical contact, equipment size and potential ability and need to be taken into account within planning for practice.

6.1 What influences child development beyond physical activity and physical education?

Although the focus of this report is child development in early childhood with relation to physical education there is a great deal to be learned from wider studies of early childhood development. There may be many factors that influence or impact on other areas of development that may also be significant factors in determining how to best support children in physical education. The data below is taken from the Millennium Cohort Study with children predominantly aged five. This large scale study serves to identify what characterizes the 21st Century child.

Today's children aged five have 'experienced a diversity of family forms in their short lives, which are more complex and unstable than was the case during earlier generations of children' (Kiernan and Mensah, 2010: 94). Between 30-38% of children of this age live in poverty (Bradshaw and Holmes, 2010) and this membership group is changeable over time. Five percent of children move from being in stable family units to living with one parent (Jones, 2010). The parenting partnership at birth is 'associated with disadvantage but post-birth relationship can temper or enhance, not directly, but reflect situations and inputs which in turn affects outcomes for the child' (Mensah and Kiernan, 2010: 94). It has also been demonstrated that the mothers' perceptions of these relationships can have a significant effect on a child's behaviour and cognitive outcomes (Jones, 2010: 72).

Attainment against expected progress, in terms of educational measures, shows that being a girl, born earlier in the academic year, having a higher birth-weight and having more involved parents are all advantageous (Hansen, 2010). Girls outperform boys in all areas of the education curriculum at the age of 5 (DfE, 2010). Those children from ethnic minority backgrounds (other than mixed race), those with low socio-economic status, English as an additional language and certain forms of Special Education Needs tend to struggle more. Girls perform better than boys in terms of Early Years Foundation Stage Physical Development ratings, however all children do better in this area than in most others. That girls outperform boys is not a new pattern, but greater emphasis is now being placed on the wider factors such as the inter-play between gender and parental decisions such as reading at home or childcare provision (Hansen, 2010). There are differences in terms of both cognitive and non-cognitive outcomes reported for different ethnic groups but these appear to be more linked with familial and demographic factors than purely ethnicity (Dearden and Sibietz, 2010).

So it would appear that in our society today, boys do less well than girls, those from ethnic minorities do less well than white children and those from lower socio-economic backgrounds do least well. So what happens if you are a white girl from a low socio-economic background or a black boy from a high socio-economic background? This is compounded when we consider that physical education covers a wide range of areas of progress, from language to physical development. If a boy is less developed linguistically than a girl, but more physically competent, which has the greater influence on participation and adherence to physical activity? There is also confusion as different categorisations and measures give contrasting perspectives - boys are considered more physically competent by some measures but less physically developed within others. The difference between 'competence' and 'development' would need unpicking before making judgements. It would also need to be clear in the minds of those practitioners working directly with children.

It is therefore important that for this report the three potentially inter-related factors of gender, ethnicity and socio-economic status are considered for their potential influence and impact on a child's physical education. This may be demonstrated within the acquisition and development of the skills to participate and the access they have to appropriate opportunities.

It would also appear from the literature reviewed that ethnicity in early childhood is the least influential of the triad of factors. This is in part due to the potential link in many studies between socio-economic status and ethnicity. Although children from black and minority ethnic backgrounds are less likely to meet physical activity guidelines than the general population (BHF, 2009) and are more likely to be overweight or obese (DoH/DCSF, 2009) whether or not it is the child's ethnicity or related factors that cause this are in question as with those aspects of child development highlighted within the Millennium Cohort Study (2010) above. Ethnicity will not therefore be directly considered in detail but will be referred to where relevant.

The next section of the report considers two questions of importance:

- Does a child's sex influence progress?
- Does a child's socio-economic status influence progress?

6.1.1 Does a child's gender influence progress?

Sex can be seen as the biological and inherited component of gender. Gender also has learned and socially constructed aspects. There are physical sex differences between children in early childhood but these are less significant in early childhood (Haywood and Getchell, 2001; Gallahue and Ozmun, 2006). For example, within early childhood there are no significant differences in either height or weight between girls and boys at the 50th centile (CGF, 1996). Although the 'structural and functional differences between boys and girls may be a significant factor in explaining gender difference in physical activity but there is little doubt that the effects are magnified by social and environmental influences' (Armstrong and Welsman, 1997: 246). These are often beyond the control of the individual and are not therefore independently modifiable, particularly at a young age where the level of individual responsibility is minimal compared with later life.

There appears to be a slight gender difference in prevalence of overweight and obesity within early childhood. In 2008/9 22.8% of children in Reception class were classed as either overweight or obese. 13.2% of boys were classed as obese and 13.8% obese with 12.6% of girls as overweight and 9.6% as obese (DoH/DCSF, 2009). Although not as marked as in later

childhood, evidence suggesting the tracking of overweight and obesity problems through childhood (BHF, 2009) means that this should be considered.

There is a small (3%) gender difference reported throughout the primary years in terms of physical education and school sport participation but this is less within early childhood than at any other point (Quick et al, 2010). Curricular participation shows no difference so this gap must appear beyond school provision.
Although within early childhood the reported difference is small, it begins a worrying trend where the divide increases by about 2% each year through the duration of compulsory education. This is compounded by the actual decline in overall participation from 70% to 40% average across secondary school (Quick et al, 2010).

In terms of physical activity participation, it appears that boys are more active than girls (Montgomery et al, 2004; Kelly et al, 2005; Jess et al, 2006). It would also appear that despite the minimal physical causes that gender differences do exist even in early childhood (Haines, 2003; Pollatou, 2005; Goodway et al, 2010). It is not as simple as suggesting that boys are more skilful than girls. Where skills are more phylogenetic in their development (less reliant on opportunity or guidance) it is suggested that girls and boys tend to develop similarly. It is only in those ontogenetic skills, such as throwing where boys have an advantage. This advantage comes from the level of opportunity and feedback they are afforded over girls, which would suggest that this is a socially constructed difference.

If there are different expectations about boys and girls in terms of physical activity participation or physical education development then this could be a significant cause of the reported difference and may be a factor in the reported differences in both activity levels and obesity levels. Research suggests that boys in early childhood tend to have a higher level of perceived body competence regardless of their actual ability, teacher feedback or their BMI (Toftegaard-Stoeckel et al, 2010). It has already been established in earlier sections that children in early childhood rely on adult feedback and guidance when judging their levels of ability. The impact of adult feedback and guidance is clearly important in future physical and emotional development and the influence of the teacher (a significant other) cannot be underestimated. Teachers need to be clear about the feedback they give and must be aware how this can influence a child's perceptions of their abilities and ultimately their self-concept and self-esteem. It is also suggested from other research that early masculine sex-typed behaviour can be seen as a predictor of later physical activity participation (Mattocks et al, 2010). Whether or not this is due to masculine behaviours being better or more that the activity culture in existence favours this type of behaviour more is not addressed within this study.

It is also important to consider how interactions with children may be influenced according to the child's gender. It has been reported that families offer different levels of support in terms of participation (Armstrong and Welsman, 1997) and that that girls get more sensitive interactions (Rose and Rudolph, 2006). Beyond the physical parameters it is important to note that in Western cultures it is more socially acceptable for girls than boys to demonstrate traits such as being withdrawn and shy whereas for boys it more socially acceptable to exhibit aggression in terms of non-social behaviour (Rubin and Coplan, 2004). It is also a common perception (Rose and Rudolph, 2006) that girls, compared to boys, engage more in pro-social interactions, they are more empathetic, more likely to seek support, express their emotions and receive higher levels from their peers in regards to emotional support. In comparison, boys tend to interact in much larger group situations, engage in more rough and tumble/ competitive play activities, more likely to demonstrate values of self-interest, receive fewer emotional

provisions in their friendships and are exposed to more direct physical and verbal victimization (Rose and Rudolph, 2006). This can be linked to the differing social expectations of boys and girls in relation to physical education and may link to actions and interactions between children and adults in activity settings.

It is possible that many of the studies that find gender differences within key parameters of progress in this area use gender as a simple analytical grouping tool. The dominant views within society expect this and therefore it needs to be included within study design. A recent small-scale study indicates an example of where this may be problematic. The data supported the notion of boys being more active when measured by pedometers; however the same group of less active girls were reported as being more active when measured using accelerometers (Howells, Caple and Jones, 2010).

It is also important to consider the relevance of a distinct boy/girl divide. There are certainly differences that are common between all boys and all girls however there are also many similarities that cross the sex divide and characteristics which would be found within and beyond gender groups. There may be more difference between two boys in terms of physical education that there may be between a particular girl and a boy. This is particularly important if children are open to a wide range of developmental influences as it implies that, for example, all boys are affected in the same way by the same thing (Francis and Skelton, 2005; Skelton et al, 2009). It also suggests that any approach to improve this situation would work for all boys. Within physical education it is acknowledged that in later childhood and beyond a 'bi-polar' view of gender is inaccurate (Flintoff and Scraton, 2006) and that a more fluid and dynamic view is needed. This is particularly important as the socialisation process within physical education links with socially constructed 'norms' of masculinity and femininity where in many cases boys activities have an advantageous position in terms of status, facilities and time (Green, 2008).

By the end of early childhood children are aware of accepted gender boundaries and models of acceptable behaviour (Skelton et al, 2009). It is therefore perhaps more important that it is understood that inequitable patterns of expectation are established at this early age and stage of development than it is known that as a whole group girls are less active than boys.

So in terms of gender differences in development, the physical differences within this age group are minimal and social and cognitive development can be similar. What differs is the perception of and expectations surrounding boys and girls participation. It would appear that gender does not offer a straightforward solution to why children in early childhood do not make excepted progress with regard to physical education characteristics. While boys can be generalised as being more active and more physically able, whilst having reduced risk of obesity, girls make better progress in terms of social, cognitive and physical development expected outcomes.

6.1.2 Does a child's socio-economic status influence progress?

Socioeconomic status (SES) remains a great topic of interest and reading for those involved in child development (Bradley and Corwyn, 2002). The reason for this is the belief that children from high SES families afford their children an array of services, goods, parental actions and social connections that potentially benefit them where the reverse is true of children from low SES families. It may be harder for families on low income to provide children with the resources and opportunities to develop. In terms of physical activity opportunities for different groups, there would appear to be differences, although socio-economic status is not a simple explanation of the differences in opportunity. 'Although social class is important this is not

necessarily at the expense of other social dynamics, such as gender and ethnicity and that there are interactive effects which serve to compound the situation' (Green, 2008: 164).

Children from families with low SES have an increased likelihood of obesity where children come from a deprived background (Burdette and Whitaker, 2005; NCMP 2008/9; Kelly and Bartlett, 2010). They are also more likely to have lesser cognitive development scores across a variety of measures (McCall, 1981, Kenny, 1995; Mensah and Kiernan, 2010). Lower SES is also an indicator of lower verbal competence (Parcel and Menaghan 1990) have higher rates of problems with language and reasoning ability (Najman, Aird, Bor, O'Callaghan, Williams and Shuttlewood, 2004); poorer linguistic outcomes (Speiker and Bensley, 1994) and be more likely to be 'late talkers' (Bates, Dale and Thal, 1995).

As with gender, socio-economic status is not a definitive factor in terms of making expected progress, for example:

- Lower cognitive attainment in children from low SES backgrounds is at its most significant in early childhood, although this gap reduces after this period (White, 1982)
- Children from higher SES backgrounds have more exposure to stimulating environments that promote learning (Crosnoe, Leventhal, Pianta and Wirth, 2010) although as schooling continues all children have similar rates of progress from their unequal starting points with gaps being less significant by the end of early childhood
- Some reports show SES having little impact on physical activity levels or, in some cases contra-indicative data. For example, if not having a car is seen as being a factor linked to low SES then it can be disadvantageous in terms of access to opportunities but also advantageous in terms of more walking due to lack of personal transport (BHF, 2009).
- Similarly, children with English as an additional language (often those with different ethnic backgrounds and from lower SES) perform less well than other children (National Commission on Education, 1993). It usually takes beyond early childhood for a child to gain competent bilingualism (Beck, 2006) but once they have this can be associated with advanced cognitive development (Bialystock, 2001).

Socio-economic status can have an effect on a child making expected progress but again, it is not a simple relationship as it is beyond the direct control of a child, in particular a young child. The factors within socio-economic status that appear to make a difference are more related to the parent than the child. Parents, or others who give care to the children, may have some control over aspects of these factors but to consider them wholly modifiable behaviours would be inaccurate. Parents have responsibility for their own decisions but cannot necessarily negate cultural or social stereotypes, or alter their socio-economic status, although they may try. Certain parental behaviour and choices can be influenced by the individual, but not the child. For example, more sustained breastfeeding and later introduction of solid foods link to less prevalence of overweight and obesity, similarly, taking the car to school or playing on computer games/watching television for more than three hours per day at age five are linked to a greater probability of becoming overweight or obese (Griffiths, Sherburne-Hawkins, Cole, Law and Dezateux, 2010). Although a child may have some opinion in terms of what they do with their time or what they eat, in early childhood this is mainly under the dictate of the parent.

Parents who recognize and reinforce the value of physical activity can have a positive influence on their child's activity patterns but can also restrict them through concerns over safety (Jess et al, 2006). If parents, in particular if both parents, are active then children are more likely to be active (BHF, 2009). If the impact of adults is to be positive, it is also important that the

views of parents are shared by others involved in the child's care and education. Different support mechanisms can have a positive impact if messages are consistent (Crosnoe, Wirth, Pianta, Leventhal and Pierce, 2006:973) but can also have a negative influence on intentions and actions. This can include when a child withdraws from or fails to show desire for activities valued by others (Coplan and Prakash, 2004).

In summary, both gender and socio-economic status can have an effect on the rate at which a child makes progress towards expectations in this area. It is not the sex or level of poverty of a child that has the direct effect, just as it is not particularly the ethnicity of a child that determines outcomes. What seems more significant is how 'society' views children within and across these sub-groups. This includes how society views boys and girls as well as how different cultures within a society views girls and boys. It also includes how different cultures are viewed within society and whether or not physical activity is valued by that culture or society as a whole. It may also relate to if that part of society is able to prioritise physical activity as more valuable than other areas. Parents, teachers and other adults all form part of the society and culture and enact the dominant discourse within those societies. Within the area of focus within this report it is also important to consider how society views all component parts, as well as the sub-groups of children. How does the society view children of this age and how does it view physical activity, physical education, sport, health and education? If the society a child is brought up in places value on the physical aspects of a child's life then there is likely to be support and encouragement for the child to develop their physical skills and for them to become involved in a wide variety of physical contexts.

Whether the developmental expectations, set out in Section Six, and the expectations set out by society, as alluded to in Section Seven, are comparable or compatible may be the key to understanding how young children can be supported to make progress towards their potential.

7. Implications for policy and practice

The areas discussed in the earlier sections of this review suggest a number of implications for policy and practice surrounding children's activity and physical education. This section draws together the areas discussed earlier and suggestions relating to the links between the content of this report and policy/practice are outlined. The suggestions made are a result of consideration of the wide range of literature and the general consensus amongst those working in the field.

This report has identified that young children in the 21st Century are not active enough and are becoming less prepared, physically, socially and cognitively for an active lifestyle. Given the level of responsibility that a young child can take for his/her actions, behaviours, attitudes and choices, it is perhaps more appropriate to suggest that the 21st Century, and those dictating policy/practice are not preparing children to become active. So what can be done? The literature suggests that it is more a question of how something should be done rather than what should be done. It is often thought that the key to appropriate opportunities comes from modifying and adapting adult physical activities to meet the needs of young children. What this viewpoint ignores is that in reality most physical activities begin naturally within the world of childhood and are formalized and adapted to meet the need and demands of adults. The activities adults take part in are constrained, extended or codified versions of children's physical activities. It can therefore be suggested that we do not need to adapt or reinvent, but that we need to look at what young children do and build on this.

Given the context described in Section Four it is easy to suggest that early childhood is a critical time for development. This is not to say that more important or significant elements of development occur here, but more that the timing is critical. Early childhood bridges a period of development based around play and informal opportunities to one where the child seems to become constrained by expectation and boundaries. At the start of early childhood approaches are open and creative; towards the end they become more rigid and purposeful. This can be seen as being necessary given the complexity of the experiences older children need and have. It also means that the foundation on which this later experience builds on needs to be firm and well constructed.

The progress that children make from birth to the beginning of early childhood is hugely important but this has occurred in mainly one setting, the home, and within the extended family. Early childhood is the time when children begin in earnest to interact with others beyond the family, attend external settings more frequently and interact with the wider environment more. The factors that now influence a child's 'nature' become more wide spread and less under the control of the family unit. It is the influence of these external factors that makes this period critically important in terms of development. How children adapt to these new or more influential factors will play a part in how well they maintain then rates of development from earlier periods of life. It is with this in mind that suggestions for what is appropriate for young children are made.

7.1 What is developmentally appropriate for children in early childhood?

A developmentally appropriate physical activity is not one that is pitched at age, size, gender, ethnicity or socio-economic grouping. It is one that looks at the holistic needs of a young child within a group and matches activities to these needs. This requires practitioners to reflect on what they know about expected progress but also of how children are progressing towards those

when pitching learning activities. The alternative – developmentally inappropriate activities – does not make sense in terms of meeting children's needs. If a practitioner plans opportunities that serve to meet the needs of a group focusing only on one characteristic, for example, gender e.g. all boys; ethnicity, e.g. all black children; or socio-economic status e.g. all children from families with low income; this ignores key principles presented within this report. These would only serve to enhance inaccurate stereotypes or limit individual development that did not match with expectations based on group progress.

This report does not suggest that the only way to meet the needs of individual children is through wholly personalized provision. This ignores both the practical realities faced within children's physical activity settings and also ignores the interactional nature of child development. Children need to be challenged by other children and ways of learning in order to reach their own potential. There are certain approaches that appear to be more suitable for most children; more developmentally appropriate in terms of physical, social and cognitive development. These approaches are advocated in the work of developmental physical educationalists (Gallahue and Ozmun, 2006; Graham, Holt/Hale and Parker, 2007; Jess et al, 2006; Jess et al, 2007; Pickup and Price, 2007).

In early childhood, the physical development focus should be on moving from an elementary pattern of movement towards a mature pattern whilst becoming adaptable in how they apply these movements in different environments and situations. Beyond this, practitioners need to focus on helping children to develop their cognitive understanding of language and basic concepts within the social environment beyond their own immediate context. This will come through negotiation and careful planning, for example, trying to force children to cooperate before they are developmentally ready may be counter-productive. Providing choice about working in pairs, groups or individually will provide the practitioner with an indication as to the point the child has reached in their social development and will enable the child to feel comfortable and happier to learn.

The important role of the practitioner is to help the child develop their confidence and ultimately their self esteem. Convincing the child that success for them is a result of what they have done and that their success will continue is an essential element in this process. The practitioner will need to use his/her understanding of the individual child and how s/he can influence development to ensure that the child is given the tools to develop a positive self image and robust self-esteem.

7.2 What is appropriate physical activity for young children?

Physical activity for children in early childhood should focus on lifestyle physical activity and basic movement skill (Jess et al, 2010). This is not necessarily the same type of activity that is engaged in by adults or even children in later childhood. Physical activity does not have to be high intensity all the time to have health benefits and children should not be put into situations whereby they experience pain or extreme discomfort. In saying this however young children should start to develop an awareness of their own bodies and be able to distinguish between how their body should feel when exercising and when they are injured. For example, a child who is mainly sedentary in their lifestyle may see getting out of breath a negative experience. In fact children should recognise that these short term changes to their bodies will have long term health benefits if they are maintained. If children are engaging in activity when once they were mainly sedentary, it is recommended that they do this gradually and build progressively, starting with 30 minutes per day (Scottish Executive Committee, 2003).

In terms of particular guidelines as to the nature of interventions encouraging physical activity there is no set prescription of what works. It is known that it needs to be over a sustained period of at least eight weeks (Riethmuller et al, 2009) and that family based interventions work well with children in early childhood (Saakslahti et al, 2004).

7.3 What is appropriate physical education for young children?

As the only compulsory opportunity for young children, this is of paramount importance in setting in place the foundations for physical activity, namely the skills, attitude and motivation to participate. This focus on skills should be developmentally appropriate but also looking to adapt these skills to different environments and contexts. It is also the time when stereotypes and misperceptions about movement are dealt with positively so that children can access wider opportunities with an open mind.

Practice with children within early childhood should focus on developing fundamental movement effectiveness. For this to occur, practitioners need to be able to identify not only what expected development is, but how different children will progress. Although there are tools that support in this area they tend to detect deficiencies against movement but do not take into account variation in typically developing children (Cools et al, 2009); or rather differently developing children.

Despite this focus on skill development it is not advocated that a traditional 'formal' method of teaching skills is used. These methods sit counter to advocated approaches to early years teaching and have been demonstrated to be less effective with younger children (Martin, Rudisill and Hastie, 2009) than a more self-determined approach that matches other early years learning approaches. Physical Education can make a difference, with extra-curricular activities, towards improving active lifestyles but this is reliant on schools and the community actively promoting the benefits (Bocarro et al, 2008) and working on consistent approaches.

7.4 What is appropriate sport and competitive sport for young children?

When considering whether or not children are ready to compete it is important to consider maturational, environmental and learning factors as a multidimensional set of determinants (Magill and Anderson, 1996). It has been suggested that the question may not be whether or not children are ready for sport but more are adults ready for children's sport (Bailey and Rasmussen, 1996: 196).

Children within early childhood are only beginning to develop a sense of social comparison. They move from a desire to want for their self (linking to their egocentric perspective not any appreciation of others), to gradually comparing with others and eventually seeking this out towards the end of early childhood (Prasser, 1996). It is not just the psychosocial factors that need consideration. As Gleeson (1986) suggests, this is about the growing child within competitive sport. As has been discussed earlier, physically, within a year group, the size differential between children may be large and this may have a significant effect on the outcome of sporting experiences and therefore on development and feelings about sport participation Musch (2001).

Two differing approaches to early sports participation appear within the literature and it seems a dichotomy exists between the views of early specialisation (focusing on one sport from an early age) and early sampling (focusing on a variety of sports until later childhood/adolescence). It would seem that although early specialisation may help some children to achieve their sporting potential, in terms of all children remaining engaged in physical activity, an early 'sampling' approach may be more beneficial (Cote et al, 2009b). This would be both in terms of developing intrinsic motivation as well as helping transferability of skills (Cote et al, 2009a). It may also serve to reduce some of the potential negative outcomes of early specialisation (Baker et al, 2009).

In summary, provision for young children should be designed around children rather than outcomes. 'It is the stage of development, not the age of the child that is crucial when planning and facilitating appropriate lessons' (Pickup and Price, 2007: 45). The literature clearly points to the need for opportunities for children in early childhood in terms of physical education to be delivered within a 'task mastery' motivational environment (Fox, 1997; Whitehead and Corbin, 1997; Gallahue and Ozmun, 2006; Jess et al, 2006; Martin, Rudisill and Hastie, 2009 and Luikkonen, 2010). It also points to the need for a sense of skill competence to be developed within key basic movement patterns prior to 'embarking on more complex physical activities' (Armstrong and Welsman, 1997: 930). It can be suggested that a child who is orientated towards the task is likely to have a significant impact on ongoing participation. A focus on achieving a goal will encourage a child to continue to participate and to strive to achieve the goal (Armstrong and Welsman, 1997).

Within a task mastery approach practitioners should be aware that comparison is not necessarily appropriate, even though children may be the same age, they will have developed different skills. It is clear that during this developmental period there should be a focus on developing a climate of achievement goals rather than performance goals. The practitioner will need to help children to be:

- Task centred
- Learning centred
- Mastery focussed

By doing this, the issues associated with performance orientation where there is an element of comparison/competition can be minimised and success will be associated with effort and mastery of the activity rather than outperforming others (Ames, 1992). It is clear that as children will be at different stages of social and physical development they will need to be focused on their own performance rather than that of others if their own performance is not going to have a negative impact on their self-esteem and ultimately their motivation to continue to participate in a particular activity. Movement and the mastery of movement competencies is personal and a concentration on personal mastery and not on social comparison will enable the child to remain confident that they will succeed and to build their physical self concept so they have a positive view of their physical selves, a vital contributing factor to future involvement in physical activity and a healthy lifestyle.

Marsden and Weston (2009: 396) recommend that, 'in a search for quality in early years PE, the learning needs of young children need to be considered equally alongside political rhetoric and aspirations for national health and internationally sporting success...at the very least, let us be vigilant and mindful of the undercurrents influencing out direction'. This statement is one which must be seriously considered and may not even go far enough. The physical development

of children in early years is vital. The external influencing factors such as national sporting success must not be allowed to dominate our thinking and the experiences we provide for children. Developmentally appropriate physical education has a place in its own right and should not be a hostage to other political agendas. This recommendation could go further, external factors cannot be dismissed but the primary concern must be the learning needs of young children over and above any external factor.

8. Key Recommendations

The theoretical underpinnings and historical and current thinking surrounding early years development are included throughout this review. The recommendations below are drawn from a review of the literature and provide a number of key recommendations which may enable teachers and other child care professionals to provide appropriate environments and opportunities to enable children to achieve their potential.

To give children in early childhood the best possible chance of making expected progress it is recommended that:

1. Approaches are designed around the **inter-related developmental needs** of children – across the physical, social and cognitive domains

2. Young children are supported in becoming **competent movers** – both children and practitioners need to know what effective movement is and what can be expected

3. Development is viewed as being age, gender, ethnicity and socio-economically **related but not dependent**

4. Practitioners are **aware of potential limiters** to progress and that this is shared with parents

5. **All adults involved are aware of their potential positive and negative influence** on children's progress and the importance of them becoming informed about expected developmental progress and recommendations

6. More needs to be done to help **society understand expectations of early childhood** rather than helping children to understand society's expectations

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