

# Children and the natural environment: experiences, influences and interventions - Summary



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Natural England



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# Project details

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A summary of the findings covered by this report, as well as Natural England's views on this research, can be found within Natural England Research Information Note RIN040 – Children and the natural environment: experiences, influences and interventions - Summary.

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# 1 Introduction

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- 1.1 Natural England commissioned a literature review to inform its developing programme of work to encourage more children to engage with the natural environment. As well as supporting the design of delivery interventions the review has identified research required to strengthen the evidence base under-pinning this area of work.
- 1.2 The review was designed to support, or challenge, a series of working assumptions about the relationship of children with the natural environment. It did this by reviewing existing literature to find empirical and anecdotal evidence; and by collecting information on a range of existing initiatives which encourage children to engage with the natural environment.
- 1.3 The University of Sheffield undertook the review and prepared a report which is available on Natural England web site at URL: <http://naturalengland.etraderstores.com/NaturalEnglandShop/NECR026>. This paper is a summary of that full review.

# 2 Relationships between children and the natural environment

## Theoretical approaches

2.1 Academics have identified that the relationship between children and the natural environment is a complex one. A series of theories have been developed by academics in order to try to explain these complexities. These theories can be identified as three types:

- those which propose that children have a natural affinity, or innate relationship, with the natural environment;
- those which propose ways in which children see opportunities in the natural environment and use them; and
- those which argue that assumptions about children and the natural environment are a result of *romantic notions*, not always related to the reality of an experience.

**Table 1** Theories about relationships of children and the natural environment

Theories	Brief description	Reference
The Ecological imagination of childhood	Children have a sense of continuity with nature: they enjoy, learn, experiment, create and find their own identity.	Cobb (1977)
Biophilia hypothesis	Contact with nature is an innate, genetically based humane need.	Wilson, (1984), Kellert, S. R. (1997), Kellert and Wilson (1993), Ulrich (1993), Verbeek and de Waal (2002)
Ecopsychological approach	Children are born with an innate sense of having a relationship with their environment.	Phenice and Griffore (2003), Thomas and Thompson (2004) and Thompson (2005)
Theory of affordances	Children see opportunities to use the landscape in a way that it may not have been specifically designed or managed for.	Gibson (1979) and Clark and Uzzell (2006)
Phenomenal landscape	How the landscape is used and experienced.	Hart (1977), Hart (1979), Moore and Young (1978) and Moore (1986)
Prospect and refuge theory	People like the opportunity to look out in the landscape and also to have a space they can be in.	Appleton (1975)

## Social variations: age as a consideration

2.2 It is widely acknowledged in a range of academic research that children's experience with the natural environment changes with age. These changes can be identified as happening across four main age groups which can be summarised as:

- early childhood: age of wonder;
- middle childhood: age of physical engagement;
- adolescent/teenage years: age of detachment as a result of increasing socialisation; and

- post 19 years old: age of re-engagement, leading to adult values, attitudes and actions.

## Cognitive and social development

- 2.3 A range of literature has identified that cognitive and social skills are developed, increased or enhanced by experiences with the natural environment. The skills developed include interpersonal skills, self esteem, sense of personal autonomy and, especially for girls, self-discipline. These pieces of research relate to children of a range of ages: pre-school children, children of middle years and children of adolescent age.

**Table 2** Relationships between the natural environment and children’s cognitive and social development

Development benefit	Description	References
Motor co-ordination and concentration	Better co-ordination and concentration abilities for children in a more natural day care setting than those in a less natural setting	Grahn, Martensson, Linblad, Nilsson and Ekman (1997)
Cognitive: reduce the decline of the abilities in terms of Piagetian model of development	‘Ability to experience how the world works in practice and to make informed judgement about abstract concepts’ (Travlou, 2006,p. 7)	Faber Taylor and Kuo (2006)
Social	Increase self-esteem and sense of self, sense of personal autonomy, interpersonal skills	Faber Taylor and Kuo (2006, pp.126-131), Kellert and Derr (1998) and Kaplan and Kaplan (1989)
Behaviour	Improved behaviour in the form of self-discipline index was higher for girls living in apartment with a greener view; no positive effect on boys.	Faber Taylor and Kuo (2006, pp.130-1) and Faber Taylor et al (2001)

## Health and well-being: Physical and mental health benefits

- 2.4 The evidence about the physical health benefits of engagement with the natural environment for children are to some extent limited. However, being outdoors is widely acknowledged as providing opportunities for moderate exercise and this in turn aids the physical health of children.
- 2.5 A variety of research has explored the benefits of play and being outdoors for children’s physical and mental health in particular. However it is not clear how much of these benefits are from the play or activity, or the play or activity being undertaken in the outdoors, or natural environment. Much of the research has not identified the location of the activity as a separate variable. Some of this research is brought together in *Health, Well-Being and Open Space* (Morris, 2003). In addition there is a constructive and very informative review of research about children and the natural environment and health issues in the two documents *Natural Fit* (Bird, 2004) and *Natural Thinking* (Bird, 2007) both produced and published for the RSPB. More recently a review was published on behalf of the Sustainable Development Research Centre, supported by the Forestry Commission, entitled *Children in the Outdoors: a literature review* (Munoz, 2009).
- 2.6 *Natural Fit* states that ‘there is very strong evidence that being outdoors is the most powerful correlate of physical activity, particularly in pre-school children’ (Baranowski et al., 1992). If physical activity is one of the drivers to increasing the health of children in England then logic suggests from the evidence available that children should be spending more time outside in order to have opportunities for undertaking moderate activity.

**Table 3** Physical health benefits of engagement of children with the natural environment

Evidence: Physical health benefits	References
Development of gross and fine motor skills developed	*Moore (1986), Moore and Wong (1997), Ebberling et al (2002) and Mackett and Paskins (2004)
Improved motor fitness, especially balance and co-ordination	Fjortoft (2004)
Improved physical skills	O'Brien and Murray (2007)
Obesity reduced with increased physical activities	Bar-Or, O. and Baranowski, T. (1994)
Reduce blood pressure	Craig et al (1996)

\*hard evidence from England

2.7 The evidence about the benefits of experiencing the natural environment for mental health is, if anything, stronger. The benefits have been shown to include:

- a reduction in, and recovery from, stress and anxiety;
- improved capacity to concentrate or pay attention;
- self regulation when pressures become too much; and
- reduction in Attention Deficit Disorder symptoms.

2.8 In some of this research there is clear evidence that the greener the space the greater the benefits, although none of the research identifies an optimum level of 'green-ness'.

**Table 4** Mental health benefits of engagement of children with the natural environment

Evidence: mental health benefits	References
Improve capacity to concentrate or pay attention	Kaplan and Kaplan (1989, 2002), Grahn et al. (1997), Hartig (1991), Wells (2000), Faber Taylor et al (2001), Kuo, Faber Taylor (2004) and Faber Taylor and Kuo (2006)
Parents report reduction in Attention Deficit Disorder symptoms	Faber Taylor, Kuo and Sullivan, (2001)
Reduce stress and anxiety	Faber Taylor and Kuo (2006) and Wells and Evans (2000)
Self regulation when social pressures become too much	Kaplan and Kaplan (1989) and Clark and Uzzell (2006)
Environments for retreat, enable the individual to be alone, recover from stress and escape from the daily constraints	Kaplan and Kaplan (1982, 1989), Ulrich 1983 and Korpela (1992)

## How childhood experiences influence adult values, behaviours and actions

2.9 In recent years there has been some research which provides evidence that children engaging with the natural environment can influence values and behaviour in adult life. In particular the evidence reveals that:

- children who visit green spaces frequently attach value to these spaces as an adult;

- children who visit woodland frequently are more likely to visit woodland in adult life; and
- childhood experiences of the natural environment can influence adult decisions about jobs/careers/professions.

**Table 5** Childhood experiences of the natural environment influence adult values and behaviour

<b>Evidence: childhood experience of natural environment influences adult values and behaviour</b>	<b>References</b>
Frequent visits to green spaces as a child resulted in valuing these spaces as a magical space in later life	Bell et al. (2004)
Playful, experiential and interactive contact with nature is directly correlated with positive environmental sensibility and behaviour late in life	Lester and Maudsley, (2006)
Childhood experiences of nature play are crucial in an individual's sense of connectedness with nature later in life	Sobel (1990), Hansen (1998) and Bisler et al. (2002)
Contact with natural environments enables a better understanding of life and its meaning	Hart, (1997)
Frequent visits to woodland as a child meant individuals were more likely to visit woodlands in adult life	Bell et al. (2003)

# 3 Factors influencing engagement between children and the natural environment

## Spaces used

3.1 The evidence reveals that children use a wide range of open spaces which allow them to engage with the natural environment. More often than not these spaces are not specifically designated for use by children.

**Table 6** Outdoor spaces children use which provide opportunities for experience of the natural environment

Type of space	Reference						
	*Hole (1966)	*Holme and Massie (1970)	*DoE (1973)	*Valentine and McKendrick (1997)	*Whewey and Millward (1997)	*Matthews et al. (2000)	Gleave (2008)
Street/road or pavement	no%	no%	28%	25%	no%	42%	28%
Designated play area	no%	no%	8%	7%		34%	no%
Garden	no%		7.5%	45%			
Parks		no%					
Balcony/stairways			33%				
Grassed area	no%		8.5%	15%			
Paved area	no%		24%				
Housing areas		no%					
Paths around estate				10%	no%		
Car parks	no%						
Wild area and waste land			8%				
Unorthodox areas (garage/roofs)			3%				
Planted and other areas			4%				
Near lakes and ponds						4%	
Woods and fields						3%	

\* hard evidence from England

## Activities undertaken

3.2 Children can, and do, undertake a wide range of activities which enable them to engage with the natural environment. These activities include play, walking, cycling, nature conservation and gardening.

## Trends over the years

3.3 The evidence points to the fact that there have been trends in some aspects of children's engagement with the natural environment over the years resulting in:

- a decrease in children playing outdoors;
- a decrease in children playing in spaces close to home, such as the street; and
- an increase in play in designated spaces.

3.4 All of these can result in a decrease in opportunities for children to engage with the natural environment.

**Table 7** Changes in outdoor experiences over time

Evidence of change	Reference
8% of parents allowed their children out to play more than they were allowed as children. 32% of parents allowed their children out the same amount as they were allowed as children. 60% of parents allowed their children out less than they were allowed as children.	*Valentine and McKendrick (1997)
71% of adults played in the street or near home daily as children. 21% of children today play in the street or near home daily.	Lacey (2007)
70% of adults experienced most adventure play in the natural environment. 29% of children today play in more designated spaces.	Gleave (2008)
Less than a quarter of children use their local 'patch of nature' once or twice a week compared to over half of the adults when they were children.	*England Marketing (2009)

\* hard evidence from England

## Culture of fear

3.5 There is a culture of fear, fuelled by the media, which is underlain with fear about danger and safety, traffic, other physical hazards, litigation and negative images. This culture of fear affects adults, but to some extent children as well and it is not clear to what extent this is influenced by the adult fears. The culture of fear expresses itself in children not being allowed to go far from home and not being allowed to go outdoors unaccompanied.

**Table 8** Factors underlying the culture of fear

Factors underlying the culture of fear	References
Risks/danger/safety	*Mathews et al. (2000); Blakey (1994); *Valentine and McKendrick (1997); Cole-Hamilton et al. (2001); Kong (2000); Bell et al. (2003); Gill (2006); HenleyCentreHeadlightVision (2005); Louv (2005).
Fears of traffic	*Holme and Massie (1970); *Moore (1986); *Wilford, Havercroft and Akerhurst (1988); *Hillman and Adams (1992); *Valentine (1997); Moore and Young (1978); Hillman et al. (1990); Huttenmoser (1995); Moore (1997); Mattsson (2001); Franklin and Conolly (2003); Valentine (2004).
Physical hazards other than traffic	*Moore (1986); Moore and Young (1978).
Child unreliable	*Hillman and Adams (1992).
Assault/Bogeyman syndrome/social apprehension	*Holme and Massie (1970); *Moore (1986); *Hillman and Adams (1992); *Valentine (1997); Moore and Young (1978); McNeish and Roberts (1995); Moore (1997); Waiton (2001); Valentine (2004); Louv (2005); Spilsbury (2005).
Fear of litigation (mainly related to educators/teachers)	Knight and Anderson 2004.
Media influence	*Valentine (1997).
Negative images: from myth, stories, media, too dark, scary	*Moore (1986); Bingley and Milligan (2004).

\* hard evidence from England

**Table 9** Expressions of the culture of fear

Expressions of the culture of fear	References
Children in inner urban, edge of town and rural locations: a change in distance allowed to go at age 11 or 12	*Mathews et al. (2000).
7-8 year olds not allowed further than their street; 13-14 year olds allowed to village, town or district; 15-16 year olds allowed as far away from home as they liked	*Lacey (2007).
Distance too great/ accessibility	*Moore (1986); *Hillman and Adams (1992); Moore and Young (1978).
Parents limit children's ability to roam freely	Moore (1986); Gaster (1991); Tandy (1999); *O'Brien et al. (2000).
Children allowed to go further from home when accompanied with a friend in inner urban, edge of town council estates and rural villages	*Mathews et al. (2000).
10-14 year olds more likely to be allowed to play out without an adult in new towns than outer London and in outer London than in inner London	*O'Brien et al. (2000).

\* hard evidence from England



## Social concerns

- 3.6 There are also a set of social concerns for children, about being in the natural environment. These include the attitudes and behaviours of adults, both family and non family members, and other children, sometimes older and in gangs.

**Table 10** Social concerns about going outside

Social concerns about going outside	References
Racism/bullying	*Hillman and Adams (1992).
Social barriers Lower social class and ethnic minorities have less access to with nature	Walker and Kiecolt 1995; Thomas and Thompson 2004; Blakey 1994.
Social exclusion young people being considered as ‘threat’, ‘problems and being marginalised	*Holme and Massie (1970); *Moore (1986); Valentine 1996; Cole-Hamilton et al. (2001); Malone and Hasluck (1998); Bell et al. (2003); Worpole (2003).
Children in a rural area felt unwelcome and under scrutiny	*Matthews et al. (2000 p.146).
10-14 year olds: females and males in an Inner London Borough, and Outer London Borough, and New town were scared of unknown adults.	*O’Brien et al. (2000).
Fear of older children and gangs	*Matthews et al. (2000).
10-14 year olds: females and males in an Inner London Borough, an Outer London Borough and New town were scared of other young people	*O’Brien et al. (2000).
Adults controlling children’s activities	*Matthews et al. (2000); *Lacey (2007); *Gleave (2008).

\* hard evidence from England

## Indoor activities

- 3.7 Indoor activities, including watching television, competes with children’s time with respect to spending time outdoors in the natural environment.

## Quality of the outdoor environment

- 3.8 For many decades the quality of outdoor spaces dedicated specifically for children have been criticised for not being designed well and thus providing for only limited opportunities. A range of pieces of research provide evidence to the elements in the landscape which are beneficial in supporting a wide range of children’s activities.

**Table 11** Factors influencing children and young people’s decisions about using the natural environment

<b>Factor influencing children’s decisions about using the natural environment</b>	<b>References</b>
Attractiveness of indoors activities: television, video games, computers, internet Indoors play area/entertainment	*Holme and Massie (1970); Louv (2005); Malone and Hasluck (1998); *Valentine and McKendrick, (1997).
Risks/danger/safety	*O’Brien et al (2000); Simons (1994); *Crowe and Bowen (1997); Malone and Hasluck (1998); Thompson (2005); *Millward and Wheway( 2005); Harden (2000).
Assault: Strangers/criminals	*O’Brien et al (2000); *Thomas and Thompson (2004).
Racism / Social fears/ Bullying: including destructive behaviour towards physical spaces	*O’Brien et al (2000) ; *Mathews et al (2000).
Social barriers Lower social class and ethnic minorities have less access to with nature	Walker and Kiecolt (1995); Blakey (1994).
Poor environmental quality: vandalism, litter	Crowe and Bowen (1997); Malone and Hasluck (1998).
Negative images: from myth, stories, media	Bingley and Milligan 2004.

\* indicates hard evidence from England

**Table 12** What children like in outdoor environments

What children like in the outdoor environment	Reference
<p>Homemade swing or tyre swing hanging from a tree (suggested more often than any piece of traditional play equipment);</p> <p>Two thirds of the boys wanted an ‘assault course’ – ropes, swings, ladders, nets, pulley, slides, ropeways, walls and forts;</p> <p>53% of girls and 76% of boys spontaneously mentioned trees: popular for standing, climbing, hiding, becoming forts or bases, making dens, providing shelter, landmarks and privacy and near them are birds, animals, conkers, fallen leaves;</p> <p>Bushes and undergrowth;</p> <p>Corn, long grass and bales, which were so popular ‘that law abiding, compliant girls will break rules to play with them’; and</p> <p>Water, ‘which in the children’s view, added an extra touch of magic to a play area’.</p>	Wilford et al 1988
<p>Variety;</p> <p>Character buildings;</p> <p>Order and tidiness;</p> <p>Quiet and uncongested streets;</p> <p>Local shops – but big stores too;</p> <p>Easy and well signposted footpath access;</p> <p>Green space;</p> <p>Things to remain the same in the countryside; and</p> <p>Access to leisure and play areas</p>	Robertson and Walford (2000, p 249)
<p>‘Secret spaces tended to be places that were perceived to be safe (and therefore not that far away from home) whilst also being flexible or ambiguous in their social role.</p> <p>Examples included the bottom of the garden and local disused parkland. The unofficial nature of these spaces enabled children to imbue them with their own distinct meaning.’</p>	Thomas and Thompson (2004, p.10)

## 4 Organisations and interventions

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- 4.1 There is no available data to establish whether more, or fewer, children belong to youth organisations now than in previous generations, nor whether more or less children are engaged in environmental education than in the past. Some of the youth organisations have a waiting list and a shortage of leaders. Other barriers which exist to increasing activities include funding, volunteers and finding enthusiastic teachers.
- 4.2 There is evidence of a range of environmental, educational, youth and play organisations which are providing and facilitating events which allow children to engage in the natural environment. Most of these organisations do not keep data on numbers of children involved in their activities because they see this as less important than undertaking the activities themselves or bidding for funding for future projects. Some of the interventions identified, most notably the education and play ones, are underpinned by a range of government policy initiatives.

# 5 The Evidence Base

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- 5.1 Some of the theories about children and the natural environment include personal arguments/speculations based on intuitive knowledge, common sense and in some cases a certain tendency to nostalgia. Hard evidence is more difficult to find especially in the English and United Kingdom context. There is also a lack of both longitudinal studies and repeat studies which can verify changes over time within a specific population or location.
- 5.2 No data sets have been identified giving comprehensive information about how many children and young people engage with the natural environment through environmental, educational, youth or play organisations although it is evident that there is an array of activities in this area, sometimes constrained by lack of volunteer leaders, inspired teachers or funding opportunities.

## 6 Suggestions for future research

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- 6.1 The evidence from the United States (Kaplan and Kaplan, 2002, Balling and Falk, 1982) has identified differences of natural environment preferences for different age groups. There is, however, a lack of evidence from Europe and particularly England, about the different experience of the natural environment for the different stages of development: stage of wonder/natural attraction, stage of exploration/physical engagement, stage of detachment/socialisation and then re-engagement (Sorel, 1990; Bateson and Martin, 1999). Research investigating development focused on these four age groups would therefore be valuable.
- 6.2 There is also a lack of evidence from England about the influence that childhood experiences of the natural environment have on adult values and behaviours. Thus further research in this area is required.
- 6.3 Contemporary research needs to complement the studies involving large numbers of children from the 1970s, 1980s and 1990s (DoE, 1973; Moore, 1986, Hillman and Adams, 1970 and 1992). Repeat studies of these key pieces of work is one possibility.
- 6.4 Risk and fear of risk is the main hindrance to children and young people benefitting from engaging with the natural environment. Research is needed to identify how real the risks are and the differences of perception of these risks between children and adults and between the perceptions and the reality of the risks. To further understand how children's access to the natural environment and freedom to play has changed over the years a study could track how different generations of one family have used the natural environment. This would build on the case study undertaken with the Thomas family in Sheffield.
- 6.5 Why don't children get out more? The answer to this might be more complex than blaming the television or computer and the 'culture of fear'. Further research exploring this could focus on children and their opinions and experiences.



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