



Children and nearby nature: A nationwide parental survey from Norway



V. Gundersen^{a,*}, M. Skår^a, L. O'Brien^b, L.C. Wold^a, G. Follo^c

^a Norwegian Institute for Nature Research (NINA), Fakkelgården, NO-2624 Lillehammer, Norway

^b Society and Biosecurity Forest Research, Alice Holt Lodge, Farnham, Surrey GU10 4LH, United Kingdom

^c Centre for Rural Research, Universitetsenteret Dragvoll, N-7491 Trondheim, Norway

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ABSTRACT

The aim of this paper is to describe the availability of and use of nearby outdoor spaces along a nature continuum by Norwegian children. We carried out a nationwide survey of 3 160 parents with children aged 6–12 years, using a comprehensive web-based questionnaire. Results from the survey show forests are the most common outdoor space in residential areas in Norway. In all, 97% of parents state that their children have access to forests within walking or cycling distance from home. When it comes to suitability for play, 88% state that their child, in general, has good or very good opportunities for play in nearby nature. A key finding of the study is that nearby nature spaces have a much more sporadic daily use by children than outdoor developed spaces such as playgrounds and sports facilities. The paper discusses reasons for this observed pattern focusing on the play environment and opportunities for children to play in nature. A central question for future research is why children merely play in their own garden and not in the forest.

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1. Introduction

Nature and outdoor recreation are an important part of Norwegian culture. We are said to be “born with skis on”, and children playing in nature areas in all sorts of weather is seen as an important and natural part of childhood (Borge et al., 2003). The concept of a “robust nature child” as an important part of the upbringing of children is expressed by Norwegian researchers (Gullestad 1992, 1997; Nilsen 2008). Whether these constructions about Norwegian culture, landscape and childhood are a myth or not is discussed by several authors (e.g. Witoszek, 1998; Syse, 2013), but studies indicate that the use and importance of the natural environment for children are less common in their daily life today than it was only a few decades ago (e.g. Gaster 1991; Lidèn, 2003; Karsten, 2005; Skår and Krogh, 2009; Sandberg, 2012; Mjaavatt, 2013). A recent review of children and outdoor play in Norway (Tordsson and Vale, 2013) stated that there is a lack of knowledge about the availability of and access to play environments for children, frequency of use and the kind of activities children undertake outside in their neighborhood.

Children in Norway should have good opportunities to play in nature, and this study has relevance to the concept of Fennoscandia. The principle of common access rights to all uncultivated lands (Outdoor Recreation Act, 1957), secures access to most nature areas where children live. Nature areas such as mountains, forests, mires and lakes cover large tracts of the landscape, and in a European context cities and villages in Norway are surrounded by nature, and in particular forests (Gundersen et al., 2006). A similar situation occurs in Sweden and Finland (Hedblom and Söderström, 2008; Gundersen et al., 2005), regarding extensive availability and easy access to nature and therefore we talk about a Fennoscandia phenomenon. Bell et al. (2005) placed Fennoscandia in what they called the northern forest culture, compared with the situation further south in Europe where there are smaller tracts of nature areas, greater restrictions on use and more altered landscapes (Konijnendijk, 1999; Pauleit et al., 2005).

Loss of nature is an important part of the concern about children's opportunities to play outdoors in many western countries (Clements, 2004; Francis and Lorenzo, 2006; Sandberg, 2012; Kernan, 2010). In Norway concern about this situation has, among others, been expressed by the ‘Office of the Auditor General of Norway’, which has asked for better control and monitoring of urban development (Riksrevisjonen, 2007). However, excellent availability and free access to nature areas do not necessarily mean that people will make use of it. There is currently a lack of

* Corresponding author.

E-mail addresses: vegard.gundersen@nina.no (V. Gundersen), margrete.skar@nina.no (M. Skår), liz.obrien@forestry.gsi.gov.uk (L. O'Brien), line.wold@nina.no (L.C. Wold), gro.follo@bygdeforskning.no (G. Follo).

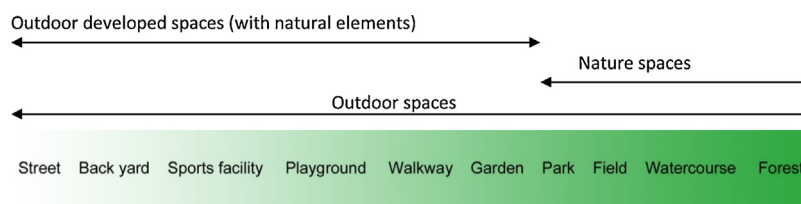


Fig. 1. Play environment along the nature continuum with examples of typical outdoor spaces nearby home.

knowledge of how inhabitants evaluate the availability of and their access to nature areas in their surroundings (e.g. Hörnsten and Fredman, 2000; Koppen et al., 2014), and this is especially true for children (Florgård and Forsberg, 2006). Internationally, there has been an increasing focus on children's mobility, their shrinking territory and their decreasing freedom of movement (Gaster, 1991; Hillman et al., 1990; Pooley et al., 2005; Karsten, 2005; Sandberg, 2012).

Knowledge about children's use of nature areas should be of special interest in the context of "Green Norway" (and Fennoscandia) where there are better availability and access to nature than in central and southern parts of Europe. In this study we present results from a nation-wide parental survey on the availability of and access to play environments for children, the frequency of use, the type of activities undertaken and the situations (e.g. institutions, organized activities, leisure time) in which activities take place. Children's outdoor play has many facets, and in this paper we focus on play in nature settings, such as forests, and play environments along a nature continuum.

1.1. Play in nature

Fennoscandian studies report positive impacts from children playing in nature including physical activity and development of motor skills as well as improved mental well-being (Bang et al., 1989; Grahn, 1991; Grahn et al., 1997; Fjørtoft, 2001, 2004; Fjørtoft and Sageie, 2000; Stokke, 2011). Research from western countries has identified positive associations between availability and access to nature areas and children's physical activity levels (Timperio et al., 2004; Roemmich et al., 2006), and the amount of time young children spend in play in outdoor spaces near their home is correlated with their level of physical activity in general (e.g. Sallis et al., 1997). Several studies claim that children prefer natural environments (Kaplan and Kaplan, 1989; Grahn et al., 1997; Evans, 2006). The effects of play and use of natural environments have been studied and show a complex interaction of (positive) environmental and societal factors including motor skills, attention, self-regulation, creativity, mental health, physical health, air quality and parental influence (Kirkby, 1989; Grahn et al., 1997; Fjørtoft, 2004; Tordsson and Vale, 2013; Chawla et al., 2014). Children's nature experiences have great potential for reducing stress and promoting better mental well-being (Korpela et al., 2002; Faber Taylor and Kuo, 2006; Chawla et al., 2014) according to the Kaplan's research on restoration (Kaplan and Kaplan, 1989).

Play is an important part of growing up and an evaluation of children's physical availability to nature areas or their perceived access is needed to understand and look at the natural environment in terms of opportunities for play. Natural settings offer qualities of openness, diversity, alteration, exploration, creativity, anonymity and wildness (Fjørtoft and Sageie, 2000; Zamani, 2016). According to Tordsson (2003), the character of nature is exceptional because it provides so many opportunities for play and because it is often less designed and managed for human purposes. It does not hold instructions for actions, but offers a diversity of opportunities for play and activity, where every child has their own

opportunity to explore, shape and change based on the child's individual background, experiences and personality (Chawla, 1991; Fasting, 2013). Children's idea of beauty is wild rather than ordered; they are stimulated by a diversity of topography and texture (Fjørtoft, 2004). A discovery play garden that is designed for wildness, and provides openness, diversity, and opportunities for manipulation, exploration and experimentation, allows children to become immersed in play and stimulates embodied nature contact. There are indications today that children, to a much greater extent than before, experience nature while under adult's control and supervision, both in day-care centers, at school, in after school care, and in organized activities during leisure time (Skår and Krogh, 2009). Recent research shows that when adults take a more hands-off approach instead of organizing and planning specific activities, then more spontaneous, unstructured and self-directed children's play can generate a more emotional, sensuous and embodied engagement with nature (Stordal et al., 2015; Skar et al., 2016).

Wild areas providing opportunities for discovery and play for children are different to landscapes designed for adults, who often prefer more manicured lawns and tidy, neat, orderly, managed, and uncluttered landscapes (Nassauer, 1997, 2011). Children value unmanicured places and the adventure and mystery of hiding places, opportunities to escape supervision and wild, spacious, uneven areas broken by clusters of plants, with opportunities for digging, climbing and using loose materials for building dens (e.g. Mjaavatn, 2013).

Studies of urban nature spaces have largely focused on parks, grasslands and residential areas, somewhat on urban forests, and to a limited degree on the comparisons between children's use of different types of areas along a nature continuum from developed spaces to more untouched nature spaces (Tordsson and Vale, 2013). A more complete picture of children's use of different outdoor spaces as presented in this paper, will contribute to broader discussions about contemporary childhood. Children's engagement with nature spaces along a nature continuum is not isolated from their everyday life in general, but influenced by a range of cultural, economic, societal and demographic factors. In this paper, we will limit the topic to discussion of the availability of and access to use of outdoor spaces, outlining principal patterns concerning children's current nature play. We define free, unstructured play as child-driven, spontaneous, and without direction from adults (Burdette and Whitaker, 2005).

1.2. Play environment along the nature continuum

A drastic reduction in outdoor play over the generations was identified in a study from England based on both quantitative and qualitative material (Valentine and McHendrick, 1997). This study suggests that parental anxieties about children's safety and the changing nature of childhood explain observed patterns of play more significantly than the public provision of play facilities and opportunities for play. Access to outdoor spaces is not only about physical availability, but also perceived access where a diversity of socio-cultural barriers and constraints, are generating parental

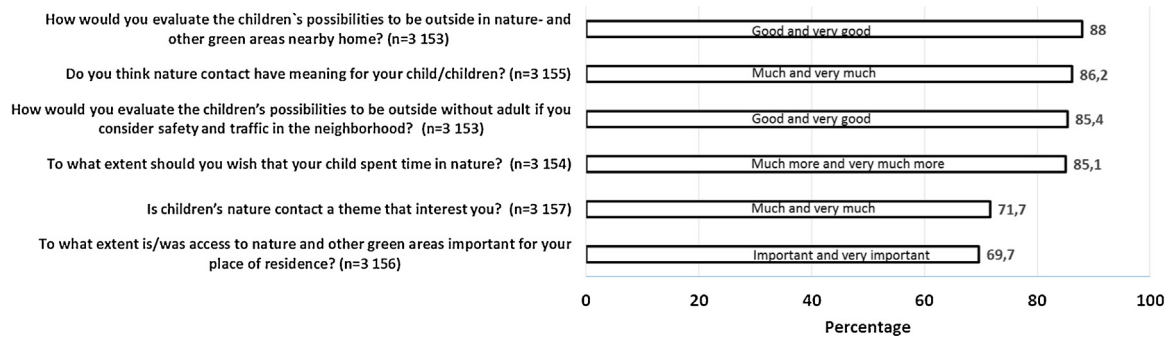


Fig. 2. Parental evaluation of six single statements about nature contact and opportunities for children's nature play in their neighborhood, depicting the proportion of the respondents that have answer value 4 and 5 (much or very much) along a five-point Likert scale (n = 3160).

concerns (Burdette and Whitaker, 2005; Skår, 2010; Skår et al., 2016). Our study focuses on the biophysical availability and use of outdoor spaces for children's play where they live, as one dimension of the complex term 'access' (which also includes social, cultural, political, economic issues and constraints). In this paper we define nearby outdoor spaces and nature spaces to be within walking and cycling distance for children (aged 6–12 years) from home.

Nature is an ambiguous term and can mean many things, and what constitutes nature is contested and contextual. For children living in inner-cities, nature might include finding a butterfly on a flower in their backyard; for children living in peri-urban or rural areas it might be a forest or a wild stream. In this paper we use the term outdoor spaces to cover public and private spaces that often incorporate differing degrees of naturalness from inner-city parks, courtyards to less managed countryside and forests. Research shows that there are developmental, social and mental benefits for children who engage in nature play, however, there are few attempts to describe the types of nature that are used and preferred by children (Burdette and Whitaker, 2005). In this paper we look along a simplified nature continuum that includes different levels of human intervention and biophysical components such as streams, lakes, ponds, forests, fields, trees and shrubs for children's play nearby home (Fig. 1). At the developed end of the continuum are outdoor developed spaces that are designed, planned and maintained for different purposes and include in our definition streets, backyards, private gardens, playgrounds, sports facilities, and conventional parks etc. However, planned and designed play environments such as these can run counter to some of the key aspects of nature play as described above (Burdette and Whitaker, 2005). At the other end of the continuum are nature spaces such as forests, fields, mires, watercourses, nature-like parks etc. Here, there is more potential for children to find, shape and change their environment and children's play in these areas is more unstructured and self-directed and initiated. This short description is, however, oversimplified, but understanding the availability of and access to play in nature along this continuum is important for understanding how future opportunities can be developed to engage children with nature near to where they live.

1.3. Research aim

This study hypothesizes that children most frequently access nature and in particular forests, because these are the most common nearby outdoor spaces in Norway (Gundersen et al., 2006) and because these natural environments are important for children's play (Tordsson and Vale, 2013). This hypothesis is especially suitable for testing in Norway, as spaces at the "natural" end of the nature continuum are very common near to where children live. A nation-wide parental survey was designed to collect key statistics on availability of and frequency of use in

pre-defined outdoor spaces in Norway. Additional information was gathered on children's activities and in what kinds of situations they undertake these different activities to help deepen understanding of the current situation. The main research question is: What kind of play environments along the nature continuum are used by children in their daily life? Other research questions are: What kind of activities do children undertake most frequently outside? In what kind of situations are the children most commonly accessing the nature continuum e.g. in leisure time, as part of school activity? The patterns identified from the survey are discussed in relation to potential management implications.

2. Methods

2.1. Sample and data collection

The target population in the study is parents with children aged 6–12 years old. The sample frame was derived from a survey panel consisting of about 60,000 volunteers who are continuously tested by the polling company to be representative of Norway's general population (TNS Gallup 2015). In total, 6537 persons in the panel comprised the target population. In December 2012 and January 2013, all 6537 persons in the target population were invited by a letter in an e-mail to participate in the study. The e-mail contained a link to an online questionnaire. We developed a comprehensive web-based questionnaire, using a set of different numeric, category and open ended questions. In cases where the parents, that got the invitation, had two or more children in the relevant age class, we asked them to answer on behalf of their youngest child to ensure sample representativeness. Altogether 3 160 parents responded and filled out the questionnaire completely, giving a response rate of 48.3%. The sample represents respondents live in 354 municipalities out of 428 in Norway, and the geographical distribution regarding number of inhabitants in the 19 Norwegian counties were representative with the general population. Our material is fairly representative regarding gender (54.7% women in our data versus 49.7% in the Norwegian population) and for urban-rural living (71.1% in our data versus 80.1% in Norway). In all, 51.4% of the children were boys, 48.6% girls, and 53% were between 6 and 9 years of age, and 47% between 10 and 12 years. The sample failed, however, in getting enough answers concerning children who had grown up in countries other than Norway. It is also important to note that the sample represent adults that more commonly have their own garden, 93.4% in our data versus 81.1% in the Norwegian population (Statistics Norway, 2014). To have a garden is very common in Norway, and these often comprise large mean plot sizes compared to other European countries. About half of the population in Norway have access to use a cabin in the mountains, forests

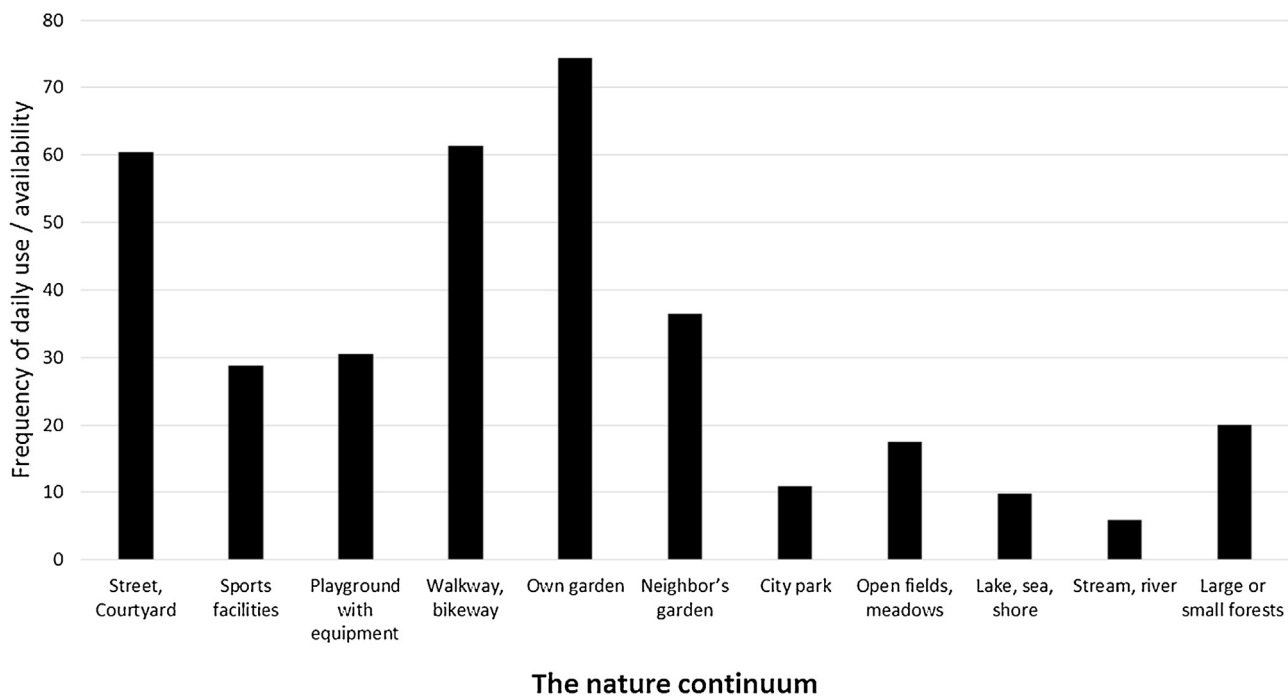


Fig. 3. Index of use value estimated as the ratio of daily use of outdoor space categories and availability of the same categories (n = 3160).

or along the coastline, and in the sample this figure is 72% (Rye, 2012).

2.2. Questionnaire and measurement

Validity, in the sense of correspondence between construct and measurement (Groves et al., 2004), depends strongly on the design of the questions in a questionnaire. The questionnaire was prepared by a multidisciplinary group including researchers in the fields of human geography, anthropology, education, biology and forestry. As far as possible we used questions, prescribed statements, scales (e.g. Likert, frequency) and categories that have been used in similar studies (Statistics Norway, 2014). The questionnaire were pre-tested by a multidisciplinary group of researchers, piloted in the panel and modified, before a final version was created. This process increased the validity of our questionnaire and we have not identified any systematic biases (Skår et al., 2014), however, there was the chance that nature will have been interpreted variously by the participants and therefore we provided some specific nature type options in the questions such as forest, lake, park etc.

It is important to be aware that we choose to ask parents for information about their children, this means that children's preferences are not presented in the study, rather we outline what parents thought. We assume that parents have considerable knowledge about their child's access to play and where this takes place, and parent's perceptions will ultimately influence the use and opportunities for play for their children. There is, however, greater uncertainty in the results on children's activities that do not occur in the presence of parents, and the use of interviews and questionnaires of adults will in many cases lead to an underestimation of the total use of nature areas by children close to home (Florgård and Forsberg, 2006). We are also aware that parents answering the questionnaire could be influenced by the context of the study: "Children and nature" and there is the possibility of socially and culturally desirable responses being given by the parents (Skår et al., 2016). However, a quantitative study design provides a strong methodological approach for obtaining universal knowledge about a phenomena that has been relatively intensively studied via

qualitative methodologies (Veitch et al., 2005; Skår, 2010; Skar et al., 2016). Regarding validity, the questions about what outdoor spaces are available within cycling distance from home, especially in winter time and for the youngest children, does not necessarily equate to very easy access, e.g. of small remnants of nature areas in residential areas.

Parents spent approximately 25 min filling in the questionnaire that asked for background information about the respondent and their children, parent's attitudes to their children's contact with nature, availability of and frequency of use of different outdoor spaces along the nature continuum, as well as activities that the children undertake outside and in what type of situation e.g. as part of leisure or school activity. The data is descriptive presented as frequencies, percentages and means, including standard deviation.

3. Results

3.1. Access to and availability of outdoor spaces

Children's nature contact is a theme that parents have an interest in as shown in Fig. 2. Altogether 88% of the parents evaluate children's opportunities to be in nature spaces nearby home as good or very good. Parents think that nature contact has meaning for their child/children, and altogether 86% stated that this mattered 'much or very much'. Most of the parents would like their child to spend more time in nature, and only 15% are satisfied with their child's current frequency of use of nature. In addition 70% of parents stated that accessibility to nature spaces was important or very important in their place of residence. Even when parents considered safety and traffic concerns in their neighborhood, 85% still felt that their child in general has good or very good opportunities for playing in nature.

When asked more directly about the availability of different nearby outdoor spaces, most of the parents evaluate this access as satisfactory (Table 1). Altogether 97% of parents stated that there is availability of large and small forest areas for their children to access within walking or cycling distance from their homes. Over 90% state their own or a neighbor's garden (93% and 92%

Table 1
Categorical answers to the question: “What kind of outdoor space exist within walking or cycling distance from residence with potential for children to play in their leisure time?” as evaluated by parents (yes or no, n = 3 160).

Outdoor space categories	Yes%	No%	Do not know%
Large or small forests	96.6	3.2	0.1
Lake, sea and shore	76.6	23.2	0.2
Stream, river	77.1	21.6	1.3
City park	48.3	50.8	0.8
Open fields, meadows	87.3	12.0	0.7
Own garden	93.4	6.5	0.2
Neighbor's garden	92.4	6.9	0.6
Courtyard, quiet street	84.5	14.9	0.6
Ball game facilities, sledging hill etc.	93.6	6.1	0.3
Playground with equipment	87.4	12.3	0.3
Walkway, bikeway	81.9	17.8	0.3

respectively) is available for their children to use. Also, availability of sport facilities for ball games and other activities (94%) and playgrounds (87%) is common. In fact we see that for all the spaces (defined in Table 1), except for parks, more than 75% of children have these types of spaces available within walking or cycling distance from their home.

3.2. Frequency of use of outdoor spaces

We asked the parents how often their child plays or stays in the identified outdoor spaces during the summer and winter (Table 2). Starting with summer, the most frequently used outdoor space on a daily basis is their own garden (69%), followed by a courtyard, quiet street (51%), walk- and bikeway (50%), and neighbor's garden (34%). Playgrounds and areas for ball games, sledging hill etc. (both 27%) were used less on a daily basis. Conversely, all types of nature spaces were less frequently used on a daily basis. For example, only 19% of the children play or stay in large or small forest areas daily, even though 97% of the children have availability of these areas near to where they live. If we add the frequency of daily use of forests with weekly use, this percentage increases to nearly 64%, compared with added daily and weekly use of courtyards and quiet streets, with a frequency of 76%. Despite the availability of forests (Table 1), the families' own gardens were used approximately four times as often as the forests spaces on a daily basis.

Index of use value estimated as the ratio of daily use of outdoor spaces and availability of the same spaces for children (Fig. 3), highlights a preference for play at the developed end of the nature continuum. The six outdoor developed spaces (Fig. 1) defined here have higher value than the forests, which have the highest value at the nature end of the continuum. Parks receive low value, and watercourses (stream, river and lake) has lowest value of all outdoor spaces.

Children play and stay outdoors far less in wintertime (Table 2), and on a daily basis all outdoor spaces were less used than in summertime. For example, the use of their own garden on a daily basis was reduced from 69% in summer to 36% in wintertime, and the daily use of forests was reduced from 19% to 12% among the respondent's children. The only category that has approximately the same use on a daily basis all year round were ball game facilities, the use of sledging hills etc.; 27% summer and 25% winter respectively.

3.3. Activities in outdoor spaces

Parents reported that their children carry out a lot of different activities outdoors in summertime. The most frequent activities they get involved in are *outdoor play* (*play hopscotch, skipping rope, meet friends*), *cycling and skating*, use of a *trampoline, playing football or other ball playing activities* or *going outside without parents knowing exactly what they are doing*. Between 70–90% of children undertake these activities on a weekly or almost daily basis

(n = 3158); while the figure is 47% for activities in forests. 53% of the children play or stay in forests a maximum of two times a month. Apart from *walking the dog*, the category *playing or stay in forests* is the activity that fewest children do on daily basis. The data shows that the use of nature spaces such as forest are not an integrated part of most children's daily life, as seems to be the case for activities that typically are being done in the more outdoor developed spaces (Table 3).

In general, children undertake these selected activities far less outside in wintertime. Some of the activities, however, are less attractive and could also be impossible to undertake at certain times in winter (e.g. trampoline, biking/skating e.g.). Typical snow based activities such as skiing, sledging or skating are common activities in wintertime, and 71% do these on a weekly or daily basis. Regarding play or stay in forests, this is done much less in wintertime than summertime. Only 6% play or stay in forests on a daily basis in wintertime.

3.4. Situations for children's use of nature spaces

Parents were asked about the different situations in which their child spends time in nature (Fig. 4). Children stay most commonly in nature spaces during holidays and weekends, in their own garden, at the cabin, and in their leisure time together with adults (Fig. 4). Altogether 2297 of the respondents state that they use a cabin/cottage, and this is an especially important situation for playing in nature for their children. The parents evaluated school time to also be an important opportunity for playing in nature, 54.8% agree and completely agree with this. Children spend less time in nature spaces during organized activities, in leisure time without adults, and in organized after school care (Fig. 4). Interestingly, children play in nature spaces in leisure time more often with adults present than without.

4. Discussion

Along the nature continuum, a clear picture emerges which shows that play is currently taking place more often in outdoor spaces at the developed end of the continuum; defined as the ratio between use and availability of outdoor spaces. Potentially, due to the fact that those who have their own garden are somewhat over-represented in our study, private gardens are the most frequently used outdoor space, used by 69.4% on a daily basis, and jumping on a trampoline is the most common outdoor activity. In contrast, only 19.3% of the children play and stay almost daily in a forest. Nature, especially forests are a common outdoor space category, and are evaluated by parents to be available for almost all (96.6%) Norwegian children within walking and cycling distance from home. These nearby nature spaces are, however, much more sporadically used by children than their own garden, courtyards, streets and other developed outdoor spaces such as ball game facilities and

Table 2

The frequency of use of different outdoor space categories in summer and winter for children aged 6–12 years (n = 3 160) by answering the question: “How often did your child play or visit (alone, with friends, with parents or other adults) in the following nearby outdoor spaces (way to school included)?”.

Outdoor space categories	Season	Never	Less than once a month	1–2 times per month	Weekly	Almost daily
Large or small forest areas	Summer	0.8	9.2	26.3	44.4	19.3
	Winter	3.0	15.3	36.6	32.7	12.3
Lake, sea and shore	Summer	2.1	21.6	34.1	34.8	7.5
	Winter	25.5	48.6	18.6	5.8	1.4
Stream, river	Summer	12.1	37.0	29.0	17.3	4.6
	Winter	32.2	43.6	15.3	6.8	2.2
Park	Summer	16.2	36.4	26.3	15.9	5.3
	Winter	27	37.5	22.3	9.8	3.4
Open fields, meadows	Summer	8.1	26.2	24.8	25.7	15.3
	Winter	11.3	23.0	30.4	24.4	10.9
Own garden	Summer	5.0	1.6	3.1	20.9	69.4
	Winter	6.0	5.2	14.4	38.9	35.5
Neighbor's garden	Summer	8.5	9.2	14.6	33.9	33.7
	Winter	12.1	15.5	24.1	30.5	17.8
Courtyard, quiet street	Summer	7.0	7.7	9.1	25.1	51.1
	Winter	8.6	10.0	14.0	30.6	36.8
Ball game facilities, sledging hill etc.	Summer	3.2	11.4	19.7	38.7	27.0
	Winter	1.9	6.7	21.6	45.2	24.7
Playground with equipment	Summer	4.6	12.9	21.3	34.5	26.7
	Winter	9.8	20.5	23.5	27.3	18.9
Walkway, bikeway	Summer	7.0	8.7	9.8	24.1	50.3
	Winter	11.2	12.1	11.2	23.5	41.3

Table 3

The frequency of activities answering the question: “What are your children doing outside in nearby environment in their leisure time, and how often?” for children aged 6–12 years (n = 3 160).

Outdoor activities	Season	Never	Less than once a month	1–2 times per month	Weekly	Almost daily
Go skiing, sledging, skating or other snow-based activities	Winter	0.4	4.7	23.8	53.6	17.5
Stay outside on their own and I do not know exactly what they are doing	Summer	13.0	8.7	8.3	34.9	35.1
	Winter	15.9	11.3	15.5	39.9	17.4
Using trampoline	Summer	2.8	8.4	12.7	34.5	41.6
	Winter	80.8	13.6	3.1	1.8	0.7
Play football or other ball playing activities	Summer	4.2	10.4	16.9	38.1	30.4
	Winter	35.1	20.9	12.5	25.5	6.0
Plays or stay in the forest or other nature spaces (Building for example cabin, stock dams, and make things from natural materials)	Summer	6.1	17.3	29.4	34.3	12.9
	Winter	14.9	25.0	29.9	24.1	6.1
Go cycling, skating etc.	Summer	1.1	1.5	6.2	33.1	58.1
	Winter	53.2	22.5	12.6	8.5	3.2
Using playground or other spaces with play facilities	Summer	4.0	9.7	19.0	37.7	29.6
	Winter	15.2	23.6	24.6	24.8	11.8
Walk the dog	Summer	48.2	19.2	12.0	12.6	8.0
	Winter	54.1	16.8	11.3	11.5	6.3
Outdoor play (play hopscotch, using skipping rope etc.)	Summer	0.7	1.7	5.5	32.3	59.8
	Winter	6.0	7.5	16.6	42.0	27.9

playgrounds. Thus, we reject our hypothesis that children are most frequently accessing nature and in particular forests areas. Instead, our data on availability and use of nearby outdoor spaces indicate that Norway is facing many of the same challenges of children's limited and often shrinking outdoor play territory as has been observed in many other western countries (e.g. Clements, 2004; Pooley et al., 2005; Karsten, 2005; Sandberg, 2012).

Internationally, there seem to be two key factors that limit access to nature spaces (Manual, 2007; Tordsson and Vale 2013):

lack of suitable places near the child's home and lack of freedom to venture there without adult supervision. Skår et al. (2016) discuss barriers for children's outdoor play in Norway, based on data from the same national survey. A set of social factors related to time pressure are evaluated as more significant barriers than environmental factors such as accessibility, safety and landscape quality. The survey outlines a context in which children appear to use very near to home outdoor spaces; and a significant amount of children's outdoor play takes place in “private” spaces such as their own garden

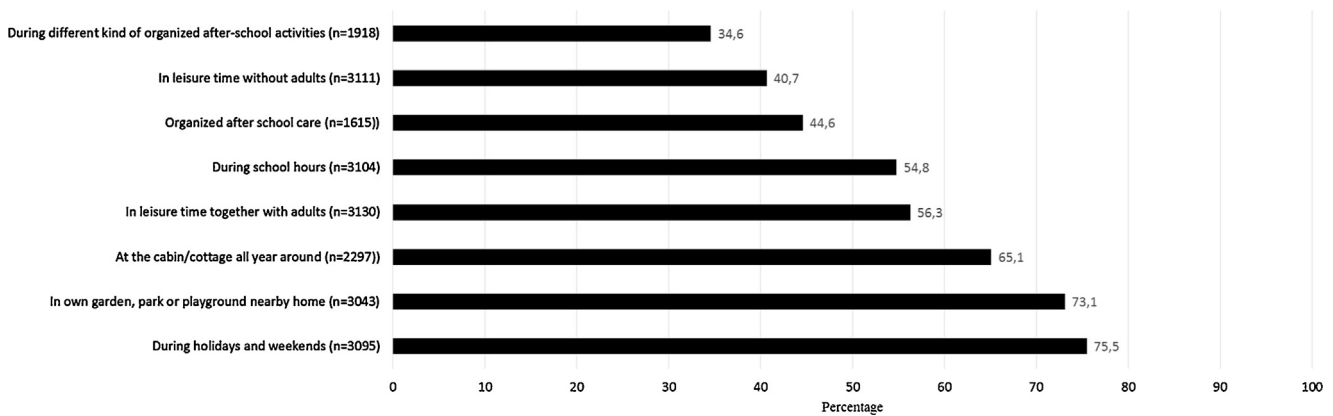


Fig. 4. Children's nature visits (n = 3160) answering agree or completely agree to the question "In what situations do your child stay in nature and green spaces? To which extent do you disagree or agree in the different alternatives below." Likert scale 1 = completely disagree, 5 = completely agree.

or a neighbor garden, and in public developed spaces. The situation for children's outdoor play in an urban or close-to-home setting in Norway corresponds, to a large extent, to similar surveys carried out in for example the United Kingdom and Sweden (Florgård and Forsberg, 2006; Stewart and Costley, 2013; Hunt et al., 2015). Parents highlight good availability of nature spaces in Norway, but still the distance for children may be too great for them to explore on their own due to a range of different reasons. Safety concerns (traffic, violence, accidents) weigh heavily in favor of adult-supervised activities for many parents (e.g. Brussoni et al., 2012; Skår et al., 2016). Young children are also spending more time in school, in after school care and in day care situations, while older children have schedules that are overbooked with organized activities (Skår et al., 2016). Outdoor play is in strong competition with easily accessed and sometimes preferred indoor activities, often in front of screens. The list of factors hindering children's outdoor play is long and is related to a complex matrix of social, cultural, political and economic constraints in our current society as well as individual and local situations in children's everyday life (Skår et al., 2016).

All kinds of outdoor developed spaces include some aspects of nature, and it can take very little of this (e.g. an individual tree) to inspire a sense of wonder and delight in children (Skår et al., 2014). We should not underestimate the role that very nearby highly developed and human-influenced landscape may have on children's free unstructured play. In many situations the kind of nature environments that are favored by children, appear to be areas that are under-appreciated by adults. For children, structurally diverse natural play places have been stressed as being more inspiring and imaginative (Fjørtoft, 2004), compared to well-organized cultivated areas and playgrounds, and this contradicts adult preferences for more structured, cultivated Savannah-like landscapes with easy identifiable trees (Kaplan and Kaplan, 1989; Grahn et al., 1997; Gundersen and Frivold, 2008). Having potential and the possibility to alter and change outdoor spaces, including using available loose materials in, for example, playgrounds, is especially important according to children themselves (Jansson, 2015). Children pay attention to simple wild spaces, dams, overgrown ditches, small green lots, bushes and hedgerows, and other urban places often neglected by adults. Such modest blue-green places are included in most outdoor developed spaces to some extent. Children create and locate their own play environments and turn parks, gardens and backyards into natural play areas when given the freedom to do so, and when these areas are available (Korpela, 1992; Manual, 2007). Children find and alter "left over" areas for unstructured and free play in nature.

Our data show that gardens are a common outdoor space of special interest for children's play, and common elements include a lawn, flowerbeds, fruit trees, bushes and hedges. Playgrounds are another common outdoor space that vary a lot along the nature continuum (Fjørtoft and Sageie, 2000; Jansson and Persson, 2010): From both natural areas selected for play that are minimally managed, and include simple play equipment made from natural materials, towards conventional playgrounds often design as flat sandy surfaces with distinct ready-made play equipment (Jansson, 2010). Children have different opportunities to play along this continuum (Bang et al., 1989; Burdette and Whitaker, 2005); from significant possibilities to find, shape and change the environment in more natural spaces, to little opportunity to manipulate outdoor areas that are mainly located, shaped and maintained by adults at the more conventional developed end of the spectrum. While research on children emphasizes variety and opportunities for exploring nature, their actual nature experiences are to a lesser extent related to designed play spaces and equipment. Gardens and playgrounds could be managed in a way that enhances opportunities for children's play by including wild elements such as boulders, climbing trees and providing opportunities to make things from natural materials. Garden seems to be an overlooked research area for children's nature contact (Tordsson and Vale, 2013).

Respondents in our survey reported high availability of nature spaces accessible from home, but these areas are more rarely used by children. Water environments such as streams, rivers and lakes received the lowest frequency of use, and today's children may have limited access to environments uncontrolled by adults, for safety as well as other reasons mentioned previously. For parks and other man-made outdoor spaces in inner-cities, the environment is not necessarily adapted for children's play; most often there is a playground within a park that attracts children together with adults. Parks are rarely used by children on a daily basis, and are more important for visits during weekends. Parks may include natural features to some extent, and there exist many examples of natural features and opportunities for children for free unstructured play (Grahn, 1991). Fields are also not very frequently used by children, and this is mainly due to access restrictions on agricultural land during the summer. In wintertime, fields are however, open for free access, and are frequently used for cross-country skiing, sledging and other snow activities. Interestingly however, the frequency of use of fields in wintertime is almost the same as for summertime. Except fields and sports facilities, the intensity of use is much lower for all other outdoor spaces in wintertime than summertime, depicting a situation where children play outside much less in wintertime.

Our respondents reported that forests are the most preferred space at the nature end of the continuum, they are very common where people live, and provide many opportunities for free unstructured play. Few studies have been carried out on the forest and nature preferences of children in the Fennoscandian countries (Gundersen and Frivold, 2008), however, the few available studies show that children appreciate wild, dense, and hidden forest more than cultivated and open forest (Grahn, 1991; Rydberg, 1998). Children prefer, to a large extent, to play in nature-like spaces or spaces including natural elements, because it offers a diversity of opportunities for play, activities and for exploration (Fjørtoft, 2001; Zamani, 2016), and place preference studies have shown that children often prefer the freedom of forest spaces without the control of their parents (cf. Moore, 1986; Korpela, 1992; Korpela et al., 2002). There are strong indications that the best nature play environments are minimally designed and maintained, and include loose materials that children can manipulate and use to construct their own environments (Fjørtoft, 2001; Zamani, 2016). For example boreal forests with a high degree of naturalness, including a high diversity of different structural elements (dead wood, old trees, mixed trees etc.) and spatial diversity (gaps, multilayered etc.), may fit with children's landscape preferences and give many opportunities for play (e.g. Grahn et al., 1997; Rydberg and Falck, 2000). Forests can provide more unstructured environments that provide places where children can alter and manipulate the landscape themselves. These factors should be crucial for the management of nearby nature for children in order to provide an environment that offers a spectrum of play opportunities.

Our data shows that most Norwegian children play in nature once or several times during a year, with or without the supervision of adults. Nature visits may be especially important experiences for those children that rarely access nature. As a contribution to the debate over concerns about children's reduced nature contact, one should perhaps be more focused on what kind of experiences these sporadic nature visits offer, compared to for example competitive indoor activities at school or home. An important quality of nature experience is that it provides a contrast to common everyday situations for children including time constraints, tasks, organization and adult presence (Burdette and Whitaker, 2005; Skår et al., 2016). Following Øksnes (2010) we should be more aware of the qualities of child's play; as it self-directed and spontaneous, and not controlled, disciplined and moderated by adults. If this is acknowledged then it becomes the adult's task to ensure that such nature play is possible for their children during the few times they access nature. Nature offers unique experiences for children and these especially occur when children have the opportunity to make places their own, through observing and experiencing them without the direction of adults (Burdette and Whitaker, 2005; Stordal et al., 2015; Skar et al., 2016).

Respondents reported that children spent most time in nature during school hours, during weekends and holidays, in their own garden and at the 'cabin'. School hours were evaluated by the parents to be an important situation for being in nature during scheduled time, and often the trip to school meant children passed through nature areas. As children spend more time in institutions such as schools and in day-care centers, and under adult supervision, this may, for many children, be the only option they have for free unstructured play in nature. For example, regular forest visits have been implemented in some schools in Britain over the past few years through the Forest School approach, and this has shown positive impacts on children in terms of confidence, social skills, language and communication, motivation and concentration, physical skills and knowledge and understanding (O'Brien and Murray, 2007). The ability to preplan and locate nature play areas where children spend much of their time, at school and in after school

care, can create opportunities for children on a regular rather than an occasional basis (Jansson et al., 2014; Mårtensson et al., 2014).

During weekends and holidays, the children have, together with adult's, often time and freedom from busy schedules to visit nature nearby home or at the cabin. Those who have a cabin are somewhat overrepresented in our study, however, more than half of the Norwegian population had access to use of a cabin and it seems to be an important place for children in Norway to have opportunities for free unstructured play in nature as well as the time to do it. This may cause social inequalities between those who have access to cabin and those who do not have access.

Because of a lack of longitudinal data, our study could not illustrate anything about the trends in children's use of and activities in their neighborhoods surroundings. A greater understanding of where children usually play and the influences on their free-play is therefore necessary for identification of any appropriate points of intervention and management to encourage greater use. Studies from Norway indicate that interventions may need to take place at both the individual level of the child (Skår et al., 2016), at a societal level through raising awareness of constraints for children to play in nature (Skår et al. 2016), as well as at the environmental management level by providing spaces with natural materials that children can use to create their own places. A central question for future research is why children merely play in their own garden and not in the forest. Research is also needed to explore what interventions and management approaches might enable and encourage greater use of nature spaces for children's free play. Since children's play and stay outside occurs much more often under the supervision of adults, and since adult preferences are different than children's, there is a need for a combination of management goals for adults and children in nearby outdoor spaces that address these differing preferences.

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