



# Children's active travel and independent mobility in four countries: Development, social contributing trends and measures

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## ABSTRACT

In many countries a decline in children's active and independent mobility, like walking and cycling is registered. In this paper the development of children's mobility in Denmark, Finland, Great Britain and Norway is compared to examine differences and similarities in these countries. Accessible data are used, which implies that not all of them are directly comparable, but they are employed as indicators of development. The trends are the same in these four countries, an increase in car use and decrease in bicycling and walking. Distance to school has increased, both as a result of bigger units and more children in private schools. Traffic is an important reason for taking children to school by car, but convenience for the parents is also part of it. Organized leisure activities has also contributed to less walking and cycling, in addition to more time pressure in families, increased access to car(s) and easier access to parents as a 'transport service' by the help of the mobile phone. The measures that different countries use in trying to meet the challenges of children's mobility tend to focus on the school trip and most often on traffic safety, both at national and local levels.

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## 1. Introduction

Research from many countries shows that an increasing number of children are taken to school and leisure activities by car. During the past 10–15 years, there has been a significant increase in car use on trips to and from school. Studies from Britain, Scandinavia and Italy show the same trend, not just among the youngest children in the first and second grades, but also among those in the upper grades (Bradshaw, 2001; Fyhri, 2002; Jensen et al., 2004; Mackett, 2002; Mackett et al., 2005a, 2005b; Prezza et al., 2001). A decrease in children's independent mobility has also been found for their leisure activities, which, to a large extent, are organized and take place outside their immediate neighborhood (Hjorthol and Fyhri, 2009; Valentine and McKendrick, 1997).

This trend is undesirable for a number of reasons. For children, being physically active is very important for their health and well-being (Torsheim et al., 2004). Several studies have suggested that a reduction in physical activity (including daily travel) contributes to increased weight and obesity among children (Cooper et al., 2003; Evenson et al., 2003; Fox, 2004; Salmon et al., 2005). Increased use

of the car as the most 'natural' travel mode for children results in less independence for them (Fotel and Thomsen, 2004). Related to this, is the claim that children who always are driven to activities do not get to know their neighborhoods properly and hence are less experienced in way-finding tasks (Preiss, 1989). Brown et al. (2008) identified further aspects of the benefits of independent mobility summarized from other European research, such as the development of motor skills, increases in additional physical activity, and the influence on cognitive development, by helping children to increase their way-finding abilities. Independent mobility, primarily walking and cycling, also helps children to make contact with other children and has a role in the development of emotional bonds between children and the natural environment (Brown et al., 2008). On the other hand getting out of the home, possibly by car, is often better for children's physical activity than staying at home. Mackett et al. (2005a) studied the activity of 200 children in different situations. They found that the home was the place where children tended to be least active. The same study showed that those who walked to events not only used more calories in traveling, but used more when they arrived than those who were taken by car.

Even though the concern about the motorization of children's mobility involves all daily out-of-home activities, traffic measures to increase children's independent travel have generally been related to the journey to school (Mackett, 2003; Jensen, 2008). Because of this, children's mobility related to leisure activities has

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received less attention. As will be shown later in this paper, knowledge about this aspect of children's mobility is sparse and scattered, which implies a limited basis for policy actions.

The concentration on the journey to school for policy measures means less attention has been paid to other policy fields that might have an impact on children's active travel and independent mobility, e.g. centralization of schools, which often means longer journeys. More students in private schools compared to public schools and freedom of choice of school can often result in longer journeys to schools. Land use and transport policies, urban developmental policy, family policies and politics of equality can also have an impact on children's daily mobility. When discussing measures, it is also important to be aware of these fields. In addition to policy areas, there are also social trends that, directly or indirectly, have effects on children's independent mobility, and contribute to the forming of the social framework of everyday life. Knowledge about these trends will be a help in understanding children's mobility and will give a better basis for the selection of measurements to improve the conditions for active travel and independent mobility among children. In this paper we use walking and cycling as a proxy for independent mobility where more specific data are not available. Since statistics on children's mobility do not always provide information about accompanying. In addition the possibility for walking and cycling safely is an important condition for children's independent mobility.

The purpose of this paper is to contribute to a better understanding of children's mobility and the social framework of daily mobility in families with children, and to examine the measures that are used to increase active and independent mobility in different countries. We also aim to discuss how these measures can be improved.

In doing so, three topics are presented and discussed. Firstly, we want to compare the development of children's independent mobility in Denmark, Finland, Great Britain and Norway to examine the trends in these countries and look for similarities and differences. Accessible data are used, which implies that not all of them are directly comparable, but they are used as indicators of development. Secondly, social trends that contribute to the formation of the social context of everyday life for children and their families are presented and discussed. Thirdly, we show how the different countries try to meet the challenges of children's mobility by looking at measures at national and local levels.

Finally, we aim to discuss differences in children's independent mobility in the light of variations in social structures, differences in institutional frameworks and in institutional and legal measures to give a better basis for implementing measurements for the increase of independence in children's mobility. Before presenting these three topics, the methods adopted in this paper are introduced.

## 2. Methods

This paper is one of the results of a joint project involving researchers from four countries: Denmark, Finland, Great Britain and Norway and funded by the Norwegian Research Council. The

project has included three research themes: (i) mobility and activity in daily life; social trends and development, (ii) analysis of children's activity and travel patterns in different contexts, and (iii) review and discussion of 'good-practice' initiatives to reduce children's car use.

The project has employed a 'mixed methods design', which is reflected in this paper including analysis of primary and secondary data and analysis of policy documents.

One of the most important data sources in this paper are the National Travel Surveys (NTS) which are carried out in all four countries. The NTS give socio-demographic information about the respondent and his/her household, such as level of education, income, occupation, number of children and their age, etc., travel activity on a particular day (registration day), work trips and other work-related questions, access to a car(s) and quality of public transport. The surveys also provide information about the frequency of use of different modes of transport (both cars and other modes). The NTS is large cross-sectional surveys representing the whole population of the four countries (cf. Table 1). On a general level the surveys provide comparable data, even if there are some variations in data collection methods in these four countries. The sources for these data are Jensen and Hummer (2002) for Denmark, L:0002\_WSPLT4046\_HLTPER7\_Aineistotoimitukset/73\_aineistodokumenttaatio/Tietokannan\_perussisalto\_HL T04\_05.doc Virpi Pastinen 02/01/2006 for Finland, for Norway we have own access to data files from the National Travel Surveys, and for Great Britain, the National Travel Survey published annually by the UK Department for Transport (2009).

In addition to the NTS, other types of available data and surveys have been utilized for the purpose of this paper. This is research partly carried out by the authors, partly carried out by other researchers. Not all of these data are directly comparable between the countries, which we also have commented upon.

A third data source is policy documents measures concerning children's daily mobility in the four countries, on both national and local levels. These documents have been analyzed and compared.

## 3. Children's mobility in four countries

### 3.1. The journey to and from school

All four countries carry out national travel surveys, some continuously, and some with fixed time intervals. Table 1 shows the characteristics of the different surveys.

As Table 1 indicates, there are differences in both the age of the respondents and in the time frame of the surveys, but the questions about daily trips in the various surveys are comparable. Great Britain has the best data describing the development of children's mobility. In addition to these data sources, there have been special surveys (mostly travel to school) at national and local levels in the various countries. These data will be used to present similarities and differences in children's mode choice in the four countries.

**Table 1**  
Characteristics of national travel surveys in Denmark, Finland, Great Britain and Norway.

	Denmark	Finland	Great Britain	Norway
Age of respondents	16–74 years (1992–97), 10–84 years (1998–02), 16–84 years (2002–03), 10–84 years (2006–)	6+ years	All household members	From 13 years—no upper limit
Travel purpose	All	All	All	All
Years of surveys	See over, and some from earlier years (not covering all days)	From 1974, every 6th year—last in 2004/5	From 1965/66 continuous from 1989	1985, 1992, 1998 2001, 2005, 2009/10

As Table 2 indicates, there are national differences. The number of children taken by car is higher in Great Britain than in the Nordic countries and children in Denmark use their bicycle to school more frequently than in the other countries. Typically, it seems that children in Great Britain either walk or are taken by car, whereas Scandinavian children use a wider range of transport modes; about one of five use public transport, which includes the school bus. The bus can be seen as a more 'active' transportation mode than the car, since it usually includes walking to and from the bus stop. Since the age group in GB is younger than in the other countries, this may explain some of the differences in car use, but probably only part of it.

Table 3 shows travel mode to and from school for children at secondary school level in the four countries. The table confirms the differences that could be seen for the younger children. About half of the children in Denmark in this age group use their bicycle to and from school, while as many as 24% of the children are taken to school by car in Great Britain. In Norway a large number of the children use public transport (including special school buses). Thus, it seems that the high amount of car use among younger children in the UK is not just a result of differences in age by school start, but is a genuine difference, and that this difference exists also for older children. Several studies have shown that amount of car use decreases substantially with increasing age (Fyhri and Hjorthol, 2009; Jensen, 2008).

### 3.2. Trends and patterns of change

A study from 2004 (Fyhri, 2006) showed that 25% of children in Norway were taken to school by car, including nearly 40% of the youngest children and 16% of those in the 6th grade

**Table 2**

Transport mode on trips to and from school in Denmark, Finland, Great Britain and Norway, children aged 6–10, Great Britain aged 5–10 (percentage).

Transport mode to school	Denmark, 6–10 years, 2002 <sup>a</sup>	Finland, 6–12 years, 2004–05 <sup>b</sup>	GB, 5–10 years, 2002 <sup>c</sup>	Norway, 6–12 years, 2002 <sup>d</sup>
Walk	23	36	51	46
Bicycle	36	25	1	12
Public transport	17	20 <sup>e</sup>	6	18 <sup>e</sup>
Private car	23	20	41	22
Other	–	–	1	2
Total	99	101	100	100

<sup>a</sup> Travel to school in 32 Danish municipalities (Jensen and Hummer, 2002).

<sup>b</sup> National Travel Survey, 2004–2005 (cf. the Methods section).

<sup>c</sup> National Travel Survey, 2006 (cf. the Methods section).

<sup>d</sup> National Survey School trips 2002 (Fyhri, 2006).

<sup>e</sup> Including school bus and taxi.

**Table 3**

Transport mode on trips to and from school in Denmark (11–15), Finland, Great Britain (11–16) and Norway (12–15) (percentage).

Transport mode to school	Denmark, 11–15 years, 1998–2000	Finland, 13–17 years, 2004–05	GB, 11–16 years, 2002	Norway, 12–15 years, 2001
Walk	22	21	38	50 (w+b)
Bicycle	49	26	2	–
Public transport <sup>a</sup>	20	36	34	43
Private car	9	13	24	7
Other	–	4	2	–
Total	100	100	100	100

<sup>a</sup> Included school bus.

(11 years). In Norway, the use of car increased from 4% to 11% for the age group 12–15 from 1992 to 2005.

In Denmark, the share of children 6–15 year old taken to school by car doubled, possibly tripled, from 1978 to 2000 (Jensen and Hummer, 2002, p. 71). The share of children 6–10 year old walking to school fell with almost 40% in the same period. During leisure time, the 11–15 year olds have tripled their car trips and diminished their level of cycling by about 30% in the period 1978–2000 (Jensen, 2008, p. 483).

In Finland the use of car increased from 16% among children aged 6–12 in 1998–99 to 20% in 2004–05 (the National Travel Survey of Finland 2004–2005, figures downloaded (cf. the Methods section)).

In 1985, 10% of children in the age group 11–16 years in the UK were taken to school by car, while by 2008 the proportion had increased to 21% (Department for Transport, 2009). The figures from the British National Travel Survey give more detailed information about the development of mode use on trips to and from school, as shown in Tables 4 and 5.

For the youngest children, aged 5–10, there has been an increase in car use from 22% to 48% from 1985 to 2008 (Table 4). For the group aged 11–16 years there was an increase from 10% to 21% in the same period (Table 5). The increase in car use results in a corresponding decline in independent mobility in the form of walking and cycling. The use of public transport has changed little in the period.

### 3.3. Distance to school

Both in Great Britain and in Norway the distance to school has increased in recent decades. In Great Britain, the distance increased both for children aged 5–10 and children aged 11–16 (Table 6).

In Norway the average distance to school increased from 3.6 km in 1992 to 4.9 km in 2001 for children aged 13–15 (The Norwegian National Travel survey).

In Finland there are also indications of increased distances to school. There are no data concerning the average distances to school, but it is known that the proportion of elementary school children living closer than 500 m from school was 29.8% in 2000 and it decreased to 28.3% in 2008 (Elyse, 2008). This is mainly due to schools being concentrated into larger units. Between 2003 and 2007 the proportion of children attending small schools (< 50

**Table 4**

Trips to and from school—children aged 5–10, Great Britain (percent).

Source: The British National Travel Survey (cf. the Methods section).

	1985/86	1995/97	2008
Walk	67	54	48
Bicycle	1	–	2
Public transport	9	9	7
Car	22	37	43
Other	2	2	0

**Table 5**

Trips to and from school—children aged 11–16, Great Britain (percent).

Source: The British National Travel Survey (cf. the Methods section).

	1985/86	1995/97	2008
Walk	52	42	40
Bicycle	6	2	2
Public transport	30	34	34
Car	10	20	21
Other	1	2	2

**Table 6**

Distance to school 1985/85 and 2008. Great Britain (km).  
Source: The British National Travel Survey.

Age group (years)	1985/86	2008
5–10	1.8 km	2.6 km
11–16	3.7 km	5.4 km

**Table 7**

Number of children usually accompanied to school in 2002 and 2008 by age. Great Britain (percent).  
Source: The British National Travel Survey (cf. the Methods section).

Age group (years)	2002	2008
7–10	78	86
11–13	27	31

pupils) decreased by 27% and the proportion of large school attendants (> 500 pupils) increased by 22% (Kumpulainen, 2008).

Similarly, in Denmark the tendency has been that that public schools are merged into bigger units, creating longer transport distances, and changes in transport mode. In Denmark among 10–16 years old with less than 1.5 km to school, 73% go by foot or by bike (Jensen and Hummer, 2002, p. 69).

Parallel to this there has also been an increase in the number of children in private schools, in Denmark (Danmarks lærerforening, 2010), Norway (SSB, 2010) and England (Department for Children, Family and Schools, 2008). The governments in these countries have seen 'choice' as a policy objective, including for schools. As car ownership has increased, the size of the set of schools that parents perceive as accessible has increased, and more parents have been able to exercise the choice of 'best' school by choosing schools that are further away.

### 3.4. Accompaniment

Several studies of the reasons for accompanying children to school have identified traffic or 'stranger danger' as important factors (Hillman et al., 1990; Joshi and MacLean, 1995; Joshi et al., 1999; Valentine, 1997). The motives, however, seems to vary between countries, as will be shown in this section. Since the surveys are carried out using different methods and some of them at different years, the comparison has to be done with care.

The British National Travel Survey (NTS) has, in recent years, added more explicit questions about accompaniment to school. Table 7 shows an increase in number of children being accompanied, both in the younger and the older groups. They also ask about the reasons for doing so, as shown in Table 8.

For the youngest group the most important reason to accompany the children is traffic danger, but nearly 30% of the parents point out fear of assault/molestation as a reason. For children from 11 to 13 years, traffic danger was also stated as the most important reason, while convenience and distance to school come as the next most frequent. It is claimed that in order to be a 'good responsible parent', most parents would stress certain worries (Valentine and McKendrick, 1997). It is a general trend in the 'risk society' to monitor and keep your child under surveillance (Fotel and Thomsen, 2004).

A nationwide Norwegian study about children's physical activities and daily travel from 2005 included a question about why the child (6–12 years) was taken to school by car. The results are shown in Table 9. 'The same route as to parent's workplace'

**Table 8**

Reasons adults give for accompanying their children to school, respondents could give more than one answer, Great Britain 2008 (percent).

Source: British National Travel Survey (cf. the Methods section).

	Children aged 7–10 years	Children aged 11–13 years
Traffic danger	58	34
Fear of assault/molestation	29	23
Convenient to accompany child	21	30
School too far away	22	29
Child might not arrive on time	18	15
Child might get lost	19	7
Fear of bullying	6	6
Other	12	15

**Table 9**

Reasons to be taken by car, children aged 6–12 years, Norway 2006 (percent).

Source: Fyhri and Hjorthol, 2006.

Reasons to be taken by car	Percent
Same route as to parents work	58
Dangerous traffic	21
Fastest/easy	18
Other siblings are taken by car	17
Saves time for the parents	15
Too far to walk/cycle	14
Saves time for the child	14
The child wants it	12
Have much to carry	12
Unsafe of other reasons	5
Friends are taken by car	2

was mentioned most often and nearly three times as frequently as traffic danger.

A study from Denmark shows that worries about traffic was the most important reason for parents to accompany their children (Fotel, 2007, p. 157). The next was worrying about other adults (molestation). In Finland, results vary mainly with where people live. The Finnish national housing study (Strandell, 2005) reveals that city parents perceive traffic as more dangerous than parents living in other types of areas do. 42% of city dwellers and less than 25% of the inhabitants of other areas perceive traffic too dangerous for a 7-year-old child moving independently.

As stated above, these surveys are not directly comparable, as both the sample sizes and questions are different. But the results from the four countries point at differences that probably can be connected to the physical environment, the traffic situations, attitudes and cultural variations in child rearing.

While the largest concerns of British and Danish parents of younger children are traffic danger and the fear of assault or molestation, the main reasons Norwegian parents mention for taking their children by car is because it is on the same route as to one of the parents' work. The Norwegian parents are also concerned with the traffic, but it is not mentioned as often as reasons related to convenience. As we see among the Finnish parents, there is a significant difference between urban and rural parents concerning traffic danger, which probable is true also for the other countries.

### 3.5. Leisure travel

Compared with school trips, there is much less information about trips related to leisure activities and longitudinal data is scarce.



Based on calculations using data from the National Travel Survey (Department for Transport, 2009), in Great Britain, the modal split of children's non-school trips show a percentage of car use of 64 in 2008, which has increased from 56% in 1996/98.

In Finland, The National Travel Survey shows that the percentage of children, 6–12 years, taken by car to their leisure activities in 2004–2005 was 45%, compared to 42% in 1998–1999 (The National Travel Survey of Finland 2004–2005).

In Norway (2005) the car use for leisure varied from 48% to 73%. For example, 63% of the children are taken by car to their sports activities (Fyhri and Hjorthol, 2006).

These figures illustrate two trends; increased car ownership and more organized leisure activities outside the immediate neighborhood, which will be discussed in the next section.

#### 4. The social framework for everyday activities in families with children

The development of children's daily mobility presented in Section 2 indicates changes in the social conditions that contribute to a decrease in children's active and independent mobility and that have produced a more 'mobility demanding' society. In this section we shall discuss some of these conditions and trends. The discussion here will concentrate on key social factors that influence the development of children's mobility.

##### 4.1. Employment rates

The increase in paid employment for women means that in most families both parents are working. In Norway for example, more than 80% of mothers with children 5+ years of age are in paid work (Kitterød, 2005). Their pre-school-age children therefore need to be transported to day care centers or care facilities, and children in the lower grades usually need to be escorted to school. Table 10 shows the development of the employment rate for men and women in the four countries, which illustrates an increase in equality between the genders.

The employment rate (defined in this way) among women varies between 66% and 75%, and there has been an increase between 1997 and 2008 (Table 10). The rate among women is somewhat higher in the Nordic countries than in the UK. The employment rate for men is higher than for women but the growth over time is greater for women. Overall, the figures

**Table 10**

Employment rate<sup>a</sup> including both full-time and part time for men and women in four countries in 1997 and 2008 (percent).

Source: Eurostat

Country	Female		Male	
	1997	2008	1997	2008
Denmark	69.1	74.3	80.5	81.9
Finland	60.3	69.0	66.2	73.1
Norway <sup>a</sup>	73.6 (2000)	75.4	81.3 (2000)	80.5 (2000)
UK	63.1	65.8	76.6	77.3

<sup>a</sup> The employment rate is calculated by dividing the number of persons aged 15–64 in employment by the total population of the same age group. The indicator is based on the EU Labour Force Survey. The survey covers the entire population living in private households and excludes those in collective households such as boarding houses, halls of residence and hospitals. Employed population consists of those persons who during the reference week did any work for pay or profit for at least one hour, or were not working but had jobs from which they were temporarily absent. <<http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tsiem010&language=en>>.

<sup>b</sup> Figures from 1997 are not available, instead figures from 2000 are used.

indicate a high employment rate among both mothers and fathers.

However, the major increase in employment among women took place earlier. In Norway for instance, the female employment increased from 45% in 1972 to 62% in 1991, which changed the conditions for everyday life for many families. It was also in the 1970s that the concept 'Life-cycle squeeze' appeared (Oppenheimer, 1974), and time problems in family life became a topic both for public discussion and research in the social sciences.

Time problems in families can be solved in many ways. Reducing working hours is one way to cope with a time pressure situation. In all of these countries part-time employment is a much more common among women than among men.

Another way is trying to reduce travel time, either by not traveling or by using a high speed transport mode like the car (which however, can be slow in e.g. the rush hour).

##### 4.2. Car ownership

Compared to other household categories, families with children tend to have very good access to car(s). In Denmark 80% of families with children own at least one car (Statistics Denmark, 2005). In Finland 97% of families with two parents and 61% of those with one parent own a car (Partanen, 2009). In England 90% of household with dependent children own at least one car (Office for National Statistics, 2010). In other English households the percentage is 73.

In Norway 97% of households with children have at least one car, with a lower percentage for those who do not have children (Norwegian National Travel Survey 2005). As these figures indicate, the level of car ownership is high in families with children with some variations: lowest in Denmark, highest in Norway.

A common opinion among families with children is that the car is a matter of necessity. Without the car, it is claimed that there is not enough time to carry out the daily activities (Freudendal-Pedersen, 2007; Hjorthol, 2006). Many families have adjusted their everyday lives to the existence of the automobile. When the day care center and the parent's job are in different parts of the city, the use of public transport can be cumbersome. The routine nature of daily life is based on habitual use of the car. A literature review of children's independent mobility and active transportation (AT) found that car ownership (in addition to greater distance, and increasing household income) is consistently associated with lower rates of AT among children aged 5–18 (Pont et al., 2009).

##### 4.3. Participation in organized activities

The level of participation in organized leisure activities for children is interesting with respect to their daily mobility. Unfortunately, we have little information about this topic in all of the countries.

In Denmark 68% of the children 7–15 years took part in organized sport activities in 2004. Most popular was football and swimming, then follows handball, badminton and gymnastics (Bille and Wulff, 2006, p. 109).

In Norway (2005) about 75% of all children in the age group 6–12 years take part in some sort of organized sports activity, primarily football. In addition, 23% sing in a choir or play in a band, and 19% are member of other organization for children (Hjorthol and Fyhri, 2009).

In Finland the proportion of children who engage in sports activities was 91% among 3–18-year-olds in 2005–06 (The Statistical Databases of the Statistics Finland, 2007). Football,

**Table 11**

Does your child use his/her own mobile phone—Denmark, Finland and United Kingdom by age groups. European survey (percent). .

Source: Flash Eurobarometer, 2008

Country	6–10 years	11–14 years
Denmark	46.6	97.4
Finland	70.2	100.0
United Kingdom	24.3	87.4

cycling and skiing were the most popular sports in 2005–06 (National Physical Exercise Study, 2005–06). The share of children practicing sports was 15% higher in 2005–06 compared to 1995. 46% of 10–14-year-old children participate actively in music lessons (Hanifi, 2009). About 24% of 9–13-year-old children living in Helsinki engaged in an art related hobby in 2008 (Stenvall, 2009). Finally, 44% are members of an association or a club (Myllyniemi, 2009).

In Britain, children aged 8–15 spent an average of 29 min a week on sports and outdoor activities in 2000, compared with 94 min on hobbies and games and 61 min on social life and entertainment (Office of National Statistics, 2003).

Many of these activities take place outside the immediate neighborhood, and for that reason will be in need of transport, very often motorized due to the distance.

#### 4.4. Access to mobile phones

Mobile telephony has introduced the ability to call or 'text' quickly to others to e.g. to change plans or make inquiries. This communication technology allows for a 'micro-coordination' of social interaction (Ling, 2004). Townsend (2000) claims that freedom from punctuality is experienced with the mobile phone. He states: 'Once one becomes accustomed to the flexibility of scheduling, the freedom from punctuality permitted by the ability to constantly updating other parties as to one's status, it is nearly inconceivable to go back (Townsend, 2000, p. 94).

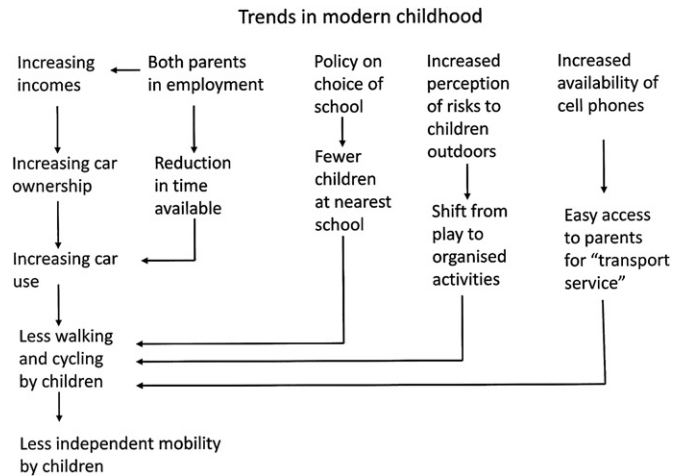
The proliferation of mobile phones has changed the way families organize their everyday life. A nationwide survey in Norway on use of the mobile telephone in the organization of daily life in families with children under 18 years, suggests that this device is important in everyday communication among family members (Hjorthol, 2008). This study showed that from the age of 10–11 years between 80% and 90% of the children had their own mobile phone. In this study, the use of transport mode to and from leisure activities for children varied by planning horizon. This survey found a significant correlation between the amount of time in advance the daily activity was planned, the use of mobile phone and the frequency of car use (Hjorthol, 2008).

Many children have their own mobile phone. A recent survey carried out for the European Commission in 2008 shows that a high percentage of children, also in the lower age groups have a mobile phone (Table 11).

In Norway the percentage is about 90% among children aged 10–12 (Telenor, 2008), and has reached 100% at the age of 13–14 years.

## 5. Measures related to children's mobility

The presentation and discussion of social trends in Section 3 indicate a development towards an increasingly mobile society with the car in a core position. In Fig. 1 these trends are summarized showing the contextual framework of children's (and their parents') daily lives.

**Fig. 1**

These interdependent 'everyday realities' illustrate that the reasons for increased car-used cannot be ascribed to one individual factor alone. The pertinent question, however, is whether they are all reflected in policies and measurements in the four countries?

#### 5.1. Policy measures at a national level

An assessment of the national policies concerning children's daily mobility reveals that children's car dependency in everyday transport is not a clear national policy issue in any of these countries, at least not for the transport authorities. These four countries all offer free public transport to (the nearest) school, depending on age and distance, and all countries have some sort of traffic education in school. The most important issues in these educational programs are how to behave in the traffic environment, the traffic rules, and traffic safety.

Traffic safety is also the primary issue concerning children and transport at national levels. For example, in the Norwegian national transport plan for 2006–2015 (St meld no. 24, 2003–2004) issues concerned with topics other than traffic safety are mentioned only once, which was a comment about the increase in escorting trips of children.

Children's independent, safe and sustainable mobility is also mentioned in the Finnish Transport policy guideline paper (2008), where children's mobility is mainly seen as a traffic safety issue and/or urban planning policy issue. The report lists future guidelines for transport policy until 2020. These include the improvements in public transport and traffic safety. In traffic safety work, special attention should be paid to the mobility of children, which requires better co-operation between the administrative sectors (Ministry of Transport and Communications, 2008).

Both in Great Britain and in Norway the national health authorities have initiated physical activity programs and campaigns for children related to the school trip, in Norway in co-operation with the Norwegian Public Roads Administration, the police and the Norwegian Council for Road Safety.

In Great Britain the national government gives grants and funding to schools that produce travel plans and initiate walking school buses. To our knowledge such measures do not exist in the other countries.

Whereas traffic safety organizations provide educational material for schools and kindergartens in the Scandinavian countries, this is a governmental responsibility in Great Britain, implemented by local authorities.

## 5.2. Local policy measures and measures initiated by schools, parents or other local groups

The municipalities and the regional authorities have the responsibilities for safe school journeys in these countries. There is a lack of systematic information about campaigns etc initiated by municipalities and regional authorities.

In Denmark 81% of the municipalities have special initiatives to improve the transport and safety of children attending schools. Only 19% of the municipalities have no initiatives, except from a campaign at the beginning of the year (Jensen and Hummer, 2002).

Some measures that are initiated by local authorities in one country are conducted through schools, or governance networks involving both public and private actors, including the police, in another country (for example, walking buses).

One concrete measure that has been tried out in all of the four countries is 'Walking school buses'. Walking school buses (WSB) are typically organized locally as systems where parents take turns in escorting a small group of children from their homes to school and back. This measure is thus based on the initiative and motivation of the parents. As such, it is a transient measure and will only last as long as the parents have children that need to be escorted (and the children are willing to be escorted). This has been raised as a criticism of the measure, but it could be argued that as long as the measure is effective, this is not necessarily a problem. A related argument is that children of parents who do not volunteer to take part in the measure may suffer from being left out of the program, which would not be the case if this measure was not based on volunteerism.

An assessment of WSB in Christchurch, New Zealand, did not discuss this problem, but focussed on the benefits (Kingham and Ussher, 2007). They found that WSB contributed to better social connections, enhancement of children's health, time savings (parents not having to escort children to school every day), got children into the habit of walking and, in that way increased, their independence.

There is little information about the extent and diffusion of walking buses, how they work or evaluations of the scheme in these four countries. One rare example is the evaluation of walking buses as an intervention including the effects on physical activity (Mackett et al., 2005b). Another example is a Norwegian study where walking school buses and walking companion schemes were included among several measures that were tested for their effect on independent mobility (Fyhri, 2006).

## 6. Discussion and conclusions

The presentation and discussion of the development of children's everyday mobility in Denmark, Finland, Norway and UK show a similar trend overall. We see a reduction in independent mobility like walking and cycling to school and an increase in car use. The reasons the parents give for taking children to school by car are primarily motivated by traffic danger and fear of assaults (with some exceptions from Norwegian studies that indicate that convenience also play a part). It is also influenced by the increase in car ownership and the increase in female employment, which is a positive and desirable development. As illustrated and summarized by Fig. 1, the trends and conditions are interdependent.

Traffic danger as a reason is a paradox, since most of the local traffic around the schools is often generated by the parents themselves. By taking their children by car, other parents may feel obliged to do the same to avoid the risk of their children of being involved in traffic accidents by letting them walk or cycle.

Even though the information comes from different types of surveys and is not directly comparable, the same pattern is found in all four countries; the amount of independent mobility is less

for leisure related travel than for the school trips. It can be claimed that as lifestyles have become more urbanized children's leisure travel has become more motorized because organized activities can be far away and reachable only by car compared to earlier decades when leisure time was spent closer to homes and activities less organized. The positive aspect of this is the greater variety of choice parents and children have regarding leisure activities. As such children also benefit from automobility (Thomsen, 2004). In families without a car it might be a risk that children (and parents) are 'left behind' (Fotel, 2007).

Although there are differences between these four countries the overall picture of children's mobility is very similar; the trend is towards less walking and cycling and more transport by (private) car. Not only the transport patterns show many similarities, but also the social changes forming the contextual framework for families' daily life are quite comparable.

The framework of everyday activities in families with children is characterized by a high degree of employment among the parents, both for fathers and mothers, although a relatively large percentage of mothers in these countries work part-time. There are indications of an active life also for children—illustrated by the high numbers of children taking part in organized leisure activities. Families with children are highly motorized, even if there are differences regarding one- and two-parent household. The easy access to the car makes car use almost obvious. The mobile phone is a relatively new 'tool' for communication between family members and for assisting in organizing daily activities. The interplay between the mobile phone and easy access to the car seems to lessen the need for planning the daily activities and reinforce the car use.

When there are two working parents in a family, there are often periods of the day when things are more hectic, chaotic or time pressured than others. The most pressing time periods are in the morning, when all family members are getting ready to leave for work, school or day care, and in the early evening when there is time for a meal before leisure activities such as sports and music begin. Shortage of time is a common reason given by parents for transporting their children to leisure activities by car (Hjorthol et al., 2005, 2006; Freudendal-Pedersen, 2007).

Even though the decrease in children's active and independent mobility is undesirable for many reasons, the policy measures to meet this challenge are limited and lack a comprehensive perspective. Our summary of these measures and schemes indicate that they are mainly connected to the journey to school, even if it is only part of children's mobility. Our review of the measures also denotes a lack of continuity of initiated schemes, and some of them are dependent on volunteers from schools or parents. In addition evaluations of schemes are rare or completely lacking. Our discussion of social trends contributing to the decrease in independent mobility shows that different policy fields are involved. A more holistic approach is needed to develop more comprehensive policies in order to change the trends affecting children's mobility.

The presentation and discussion in this paper also reveals a lack of data about the totality of children's mobility in most of these countries, especially longitudinal data. Surveys of children's mobility are needed to give basic knowledge to policy makers. Carrying out the same surveys in several countries in order to make comparisons, with repetitions at defined intervals to see whether the actual policies have effects would be particularly advantageous.

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