



Research Paper

# How available to European children and young people with cerebral palsy are features of their environment that they need?



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## ABSTRACT

**Background:** The UN Convention on the Rights of Persons with Disabilities requires accessibility to the physical and social environments. However, individuals with cerebral palsy (CP) have many difficulties in accessing the environment they need for functional independence and social inclusion.

**Aims:** To examine the availability of environmental features which children with CP need for optimal participation, and whether availability changed for them between ages 8–12 and 13–17 years.

**Methods:** The sample is the 594 children with CP, born 31/07/1991–01/04/1997, who took part in the SPARCLE study at age 8–12 (SPARCLE 1) and again at 13–17 years (SPARCLE 2). Participants were randomly sampled from population registers of children with CP in eight European regions; one further region recruited from multiple sources. Data about environment were captured with the European Child Environment Questionnaire (60 items). Differences in availability of environmental features between childhood and adolescence were assessed using McNemar's test; differences between regions were assessed by ranking regions. Differences in availability between regions were assessed by ranking regions.

**Results:** For seven environmental features significantly ( $p < 0.01$ ) fewer individuals needed the feature in SPARCLE 2 than in SPARCLE 1, whilst for two features more individuals needed the feature. Nine features in SPARCLE 1 and six features in SPARCLE 2 were available to less than half the participants who needed them. Eight features showed significantly ( $p < 0.01$ ) higher availability in SPARCLE 2 than in SPARCLE 1 (enlarged rooms, adapted toilet, modified kitchen and hoists at home, adapted toilets and lifts at school, an adequate vehicle, grants for home modifications) while none showed significantly lower availability. The relative rankings of the better and less good regions persisted from the age 8–12 year age group to the 13–17 year age group.

**Conclusions:** Needed environmental features are unavailable to many children at ages 8–12 and 13–17 years. This lack of availability is more pronounced in some regions than others, which probably results from their policy, legislative and statutory frameworks.

## What this paper adds?

- Many children and young people with cerebral palsy do not have available to them the environmental features they need to

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participate fully; both at ages 8–12 years and 13–17 years

- For instance, nine features in SPARCLE 1 and six features in SPARCLE 2 were available to less than half the children who needed them.
- It was encouraging that there was higher availability in SPARCLE 2 for: Enlarged rooms, adapted toilet, modified kitchen and hoists at home, adapted toilets and lifts at school, an adequate vehicle, grants for home modifications.
- Striking differences between European regions in the availability of needed environmental features had been recognised for children with CP. This study shows that this variation persists into adolescence and that the relative rankings of the better and less good regions were very similar in both age groups.

## 1. Introduction

Article 9 of the 2006 UN Convention on the Rights of Persons with Disabilities (United Nations, 2006) requires: “States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas.” Such obligations can be considered within the International Classification of Functioning, Disability and Health for Children and Youth (ICF-CY), whose objective is to provide a framework for describing and organising information on functioning and disability using a unified and standardized language (World Health Organization, 2007). It conceptualises a person's level of functioning as a dynamic interaction between health conditions, environmental factors, and personal factors. Article 9 is also consistent with the social model of disability (Oliver, 1990), which proposes that disability is caused by the way society is organized, rather than by a person's impairment or difference. To address Article 9, barriers that restrict life choices for disabled people must be removed so that people with disability can be independent and equal in society, with choice and control over their lives.

For children and youth with disabilities, every domain of the environment in the ICF is associated with participation (Anaby et al., 2013; Colver et al., 2012; Willis et al., 2016). The most common facilitators are social support of family and friends and geographic location. The most common barriers are attitudes, physical environment, transportation, policies, and lack of support from staff of service providers (Anaby et al., 2013).

Individuals with cerebral palsy (CP) may have many difficulties in accessing the environment which reduce their functional independence and social inclusion (Colver et al., 2012; Fauconnier et al., 2009; Michelsen et al., 2009; Michelsen et al., 2014). The SPARCLE 1 study, in which European children with CP were visited at age 8–12 years, found that children with more impaired walking ability had less access to the physical environment, transport and social support they needed than those with less severe impairment. They also experienced less favourable attitudes from family and friends. However, attitudes of teachers and therapists were similar for children with all levels of impairment. The availability of needed features, across children with all severities of impairment, showed significant variation between European regions (Colver et al., 2011).

Children in the SPARCLE 1 cohort were visited again aged 13–17 years (SPARCLE 2). We are not aware of any papers that have examined longitudinal change in the availability of needed environmental factors. We therefore aim in this paper to examine the availability of needed environmental features for young people with CP at 13–17 years and whether availability changed between 8–12 and 13–17 years.

## 2. Methods

### 2.1. Setting and participants

This work is part of the SPARCLE project, which studies the participation and quality of life of children and adolescents with CP in Europe. The sample for this study is the 594 children with CP who took part in both SPARCLE 1 and 2. They were born between 31 st July 1991 and 1 st April 1997, and were randomly sampled from population registers of children with CP in eight European regions (southeast France, southwest France, southwest Ireland, west Sweden, north England, Northern Ireland, east Denmark, and central Italy); one further region, northwest Germany, recruited from multiple sources.

The overall design of the project, including sample size calculations, is described in previous papers (Colver & Dickinson, 2010; Colver & SPARCLE Group, 2006).

Analysis of drop-out has been reported (Dickinson et al., 2012). In summary, of the 818 families who participated in SPARCLE1, 594 (73%) participated in SPARCLE2. The significant predictors of drop-out were parental education and stress, family structure and region. The main causes of drop-out were death (32), moved out of region (13), or could not be traced (51).

### 2.2. Measures

Data about the features of the environment which individuals needed to optimise their participation were captured with the parent-reported European Child Environment Questionnaire (ECEQ). This questionnaire has 60 items, each of which asks about a feature in the physical, social, or attitudinal environment of children (Dickinson, Colver, & SPARCLE Group, 2011). In SPARCLE 1 the items yielded nine domains: physical environment in the home, school and community; transport; social support in the home and community; and attitudes of family and friends, teachers and therapists, and classmates. However, the scoring of these domains applied only to SPARCLE 1 and we have not been able identify a scoring metric which is generalisable. In this paper we retain the

**Table 1**  
Distribution of the sample of 594 individuals by sex, region and GMFCS.

	number	%
Sex		
Male	345	58
Female	249	42
Region		
Denmark: East	77	13
France:		
Southeast	50	8
Southwest	55	9
Germany: Northwest	64	11
Ireland: Southwest	74	12
Italy: Central	41	7
Sweden: West	68	11
UK:		
North England	80	13
Northern Ireland	85	14
	SPARCLE 1 (8–12 years)	
	number	%
	SPARCLE 2 (13–17 years)	
	number	%
Gross motor function		
I Walks and climbs stairs, without limitation	176	30
II Walks with limitations	132	22
III Walks with assistive devices	102	17
IV Great difficulty with walking, limited self-mobility	85	14
V Unable to walk, severely limited self-mobility	99	17

domain structure for the purposes of grouping the items but do not undertake analysis by domain scores. Two of the items (32 and 60) were not exactly the same in SPARCLE 1 and 2 and so are omitted. Thus there are 58 items. Forty-one of the items ask if an environmental feature is needed or not. If it is needed, the parent is then asked if it is available to them or not. A further seventeen ask about emotional support, attitudes and essential facilities; it is assumed all people need these latter features and so the possible response categories are only available/not available (Dickinson et al., 2011).

Walking ability was captured using the five categories of the gross motor function classification system when the young person was 13–17 years old (GMFCS) (Palisano et al., 1997).

### 2.3. Statistical methods

We first present the distribution of the sample by sex, age, region and GMFCS.

The availability of environmental features was calculated as a percentage for each item: number of individuals needing and having available the feature/number of individuals needing the feature. We used radar plots to show how availability changed between SPARCLE 1 and 2.

In order to undertake statistical testing for differences between SPARCLE 1 and 2 in the need for each feature, we examined only those who responded to the corresponding item in both SPARCLE 1 and 2, which marginally reduced the sample size for each item. In order to examine whether availability of each needed feature changed between SPARCLE 1 and 2, we examined the individuals who needed the feature in both SPARCLE 1 and 2. We used McNemar's test of paired proportions (Altman, 1990) for both the above analyses. To lessen the chances of spurious significance due to the performance of almost 100 significance tests, we set the threshold for significance at  $p < 0.01$ .

To assess differences between regions, each feature was ranked from 1 to 9 in terms of its availability by region in SPARCLE 1 with 9 being the region with worst availability. The rank scores for each feature were then summed by domain to generate ranking of domain by region. These rankings were then summed to generate a ranking for overall availability by region. The same procedure was then performed for SPARCLE 2.

We used SPSS software v. 20.0 and Stata 15 for statistical analysis.

### 2.4. Ethics

In each country, we obtained ethics approval or a statement that only registration was required, as appropriate. We obtained signed consent from all parents and from young people who could give meaningful consent.

**Table 2**

Sample sizes and p-values for statistical comparisons of need and availability of environmental features in SPARCLE 1 (SP1) and SPARCLE 2 (SP2).

Item	Domain/Feature	Need		Availability among those who need the feature			
		No. (%) reporting item in both SP1 and SP2 <sup>a</sup>	p-value comparing need in SP1 and SP2 <sup>a</sup>	No. (%) needing item in both SP1 and SP2 <sup>a</sup>	p-value comparing availability in SP1 and SP2 <sup>b</sup>		
<i>Physical environment</i>							
<i>Home (7 items)</i>							
1.	Enlarged rooms at home	589	(99%)	0.840	258	(43%)	< <b>0.001</b>
2.	Adapted toilet at home	588	(99%)	0.698	197	(33%)	< <b>0.001</b>
3.	Modified kitchen at home	590	(99%)	0.049	91	(15%)	< <b>0.001</b>
17.	Walking aids	587	(99%)	<b>0.002</b>	218	(37%)	0.090
18.	Hoists at home	592	(100%)	< <b>0.001</b>	148	(25%)	< <b>0.001</b>
19.	Communication aids at home	592	(100%)	0.029	102	(17%)	0.513
45.	Wheelchair or modified buggy	589	(99%)	0.739	312	(53%)	0.019
<i>School (4 items)</i>							
47.	Ramps at school	578	(97%)	1.000	243	(41%)	0.061
48.	Adapted toilets at school	579	(97%)	0.092	245	(41%)	<b>0.004</b>
49.	Lifts at school	577	(97%)	< <b>0.001</b>	140	(24%)	< <b>0.001</b>
50.	Communication aids at school	571	(96%)	0.923	148	(25%)	0.763
<i>Community (7 items)</i>							
4.	Ramps in public places	590	(99%)	0.033	297	(50%)	0.033
5.	Adapted toilets in public places	591	(99%)	0.552	224	(38%)	0.500
6.	Lifts in public places	587	(99%)	0.011	335	(56%)	0.174
7.	Escalators in public places	587	(99%)	0.038	122	(21%)	0.369
8.	Suitable doorways in public places	592	(100%)	0.159	287	(48%)	0.190
9.	Room in public places to move around	591	(99%)	0.383	299	(50%)	0.196
10.	Smooth pavements	590	(99%)	0.019	389	(65%)	0.270
<i>Transport (6 items)</i>							
11.	Adequate vehicle	591	(99%)	< <b>0.001</b>	352	(59%)	< <b>0.001</b>
12.	Accessible car parking	591	(99%)	0.091	352	(59%)	0.170
13.	Adequate bus service	588	(99%)	0.027	153	(26%)	0.052
14.	Accessible buses	587	(99%)	0.038	158	(27%)	0.114
15.	Accessible train services	588	(99%)	0.815	141	(24%)	0.022
16.	Accessible taxis	589	(99%)	0.710	185	(31%)	0.465
<i>Social support</i>							
<i>Home (10 items)</i>							
20.	Receive grants for equipment	591	(99%)	0.049	326	(55%)	0.773
21.	Receive grants for home modifications	582	(98%)	0.078	226	(38%)	<b>0.008</b>
22.	Receive grants for holidays	587	(99%)	0.108	229	(39%)	0.639
23.	Information about financial benefits	589	(99%)	< <b>0.001</b>	449	(76%)	0.268
25.	Emotional support from family members at home	Needed by all			587	(99%)	0.527
26.	Emotional support from wider family/friends	Needed by all			584	(98%)	0.031
27.	Physical help from family members at home	587	(99%)	< <b>0.001</b>	434	(73%)	0.593
28.	Physical help from wider family/friends	585	(98%)	< <b>0.001</b>	364	(61%)	0.549
36.	Helper or assistant at home	591	(99%)	0.013	170	(29%)	0.077
37.	Family look after child for a few hours	591	(99%)	< <b>0.001</b>	276	(46%)	0.070
<i>School (4 items)</i>							
30.	Teachers/doctors listen to your views	Needed by all			576	(97%)	0.659
46.	Child has school placement s/he needs	Needed by all			574	(97%)	0.346
51.	Special staff help child in school	577	(97%)	0.018	440	(74%)	0.423
57.	Physical help from teachers/therapists	575	(97%)	< <b>0.001</b>	409	(69%)	0.028
<i>Community (8 items)</i>							
24.	Suitable leisure facilities	Needed by all			556	(94%)	0.864
29.	Physical help from people in public places	587	(99%)	0.063	272	(46%)	0.825

(continued on next page)

Table 2 (continued)

Item	Domain/Feature	Need		Availability among those who need the feature			
		No. (%) reporting item in both SP1 and SP2 <sup>a</sup>	p-value comparing need in SP1 and SP2 <sup>a</sup>	No. (%) needing item in both SP1 and SP2 <sup>a</sup>	p-value comparing availability in SP1 and SP2 <sup>b</sup>		
33.	Health service staff co-ordinate work well	<i>Needed by all</i>		573	(96%)	0.152	
34.	Social services co-ordinate work well	574	(97%)	0.542	153	(26%)	0.021
35.	Child looked after elsewhere for few days	592	(100%)	0.154	178	(30%)	0.724
38.	Parent support groups in area	582	(98%)	0.022	179	(30%)	0.889
39.	Counselling available	574	(97%)	< <b>0.001</b>	264	(44%)	0.299
42.	People in public places have positive attitude to child	<i>Needed by all</i>		572	(96%)	0.018	
<i>Attitudes</i>							
<i>Home (5 items)</i>							
31.	Child allowed extra time at home	585	(98%)	0.011	414	(70%)	0.109
40.	Family members at home have positive attitude to child	<i>Needed by all</i>		585	(98%)	0.366	
41.	Wider family and friends have positive attitude to child	<i>Needed by all</i>		583	(98%)	0.435	
43.	Encouraged to reach potential by family members at home	<i>Needed by all</i>		585	(98%)	0.593	
44.	Encouraged to reach potential by wider family/friends	<i>Needed by all</i>		582	(98%)	0.013	
<i>School (7 items)</i>							
52.	Allowed extra time at school	556	(94%)	0.027	422	(71%)	0.502
53.	Encouraged to reach potential by teachers/therapists	<i>Needed by all</i>		569	(96%)	0.276	
54.	Encouraged to reach potential by classmates	<i>Needed by all</i>		514	(87%)	0.397	
55.	Emotional support from teachers/therapists	<i>Needed by all</i>		552	(93%)	0.325	
56.	Emotional support from classmates	<i>Needed by all</i>		511	(86%)	0.926	
58.	Teachers/therapists have positive attitude to child	<i>Needed by all</i>		571	(96%)	0.670	
59.	Classmates have positive attitude to child	<i>Needed by all</i>		539	(91%)	0.272	

### 3. Results

In SPARCLE 1, the mean age of the sample was 10.4 years (range: 7.7–13.6), and in SPARCLE 2, 15.1 years (range: 12.0–18.6). The sample distribution by sex, region and GMFCS is shown in Table 1.

Apart from the seventeen features prejudged always to be needed (see Methods), the proportion of individuals needing a feature ranged from 89% for 'Item 23. Information about financial benefits' (SPARCLE 1) to 25% for 'Item 19. Communication aids at home' (SPARCLE 1) and 25% for 'Item 3. Modified kitchen at home' (SPARCLE 2).

The first five columns of Table 2 shows, for each environmental feature, the number who report that item in both SPARCLE 1 and 2 and the results of statistical comparisons for needing the feature between those in SPARCLE 1 and 2. Comparing SPARCLE 1 and SPARCLE 2, significantly ( $p < 0.01$ ) more adolescents needed two items: hoists at home and lifts at school. However, significantly fewer needed eight items: walking aids, an adequate vehicle, information about financial benefits, physical help from family members at home, physical help from wider family and friends, family to look after the child for a few hours, physical help from teachers or therapists, and counselling.

Features with the highest availability (individuals having access to a feature as a proportion of those needing the feature) were attitudinal. For instance, 'Item 40. Family members living in home have positive attitude towards child' had the highest availability at 99% in SPARCLE 1 and 2. 'Item 3. Modified kitchen at home' had the lowest availability at 17% in SPARCLE 1 and 34% in SPARCLE 2. Radar plots (Fig. 1) show that nine features in SPARCLE 1 (modified kitchen at home, hoists at home, smooth pavements, accessible train services, receive grants for holidays, information about financial benefits, helper or assistant at home, parent support groups in area, counselling available) and six features in SPARCLE 2 (modified kitchen at home, adapted toilets in public places, receive grants for holidays, information about financial benefits, parent support groups in area, counselling available) have less than 50% availability.

Table 2 also shows in columns 6–8 the number needing an item in both SPARCLE 1 and 2 and the results of statistical comparisons of availability of the feature between those in SPARCLE 1 and 2.

Comparing SPARCLE 1 and SPARCLE 2, eight features showed significantly ( $p < 0.01$ ) higher availability in SPARCLE 2 than in SPARCLE 1 (enlarged rooms, adapted toilet, modified kitchen and hoists at home, adapted toilets and lifts at school, an adequate vehicle, and grants for home modifications); none showed significantly lower availability. Although four features (walking aids, communication aids at home and school, and family members looking after the child for a few hours) showed reduced availability when all respondents were considered (see Fig. 1), none of these changes were statistically significant when tested on the sub-group who needed the features in both childhood and adolescence.

Table 3 presents the changes in ranks of environmental features across regions over time. Northern European regions performed better than southern ones at both ages. The overall rankings of the better and less good regions were similar at both ages, except that north England and Northern Ireland exchanged rank positions; as did east Denmark and west Sweden.

These patterns were replicated for each of the three domains, physical environment, social support and attitudinal; both in terms of the better performance of northern European regions and the rankings of the better and less good regions. However, social support in east Denmark moved from rank 1–5, mainly due to the reduced support in school.

## 4. Discussion

### 4.1. Main results

We used the ECEQ to capture the extent to which children and young people with CP across Europe have access to needed environmental features. We examined the differences in the results for the children aged 8–12 years (SPARCLE 1) and the same young people when 13–17 years (SPARCLE 2).

For eight features significantly ( $p < 0.01$ ) fewer individuals needed the feature in SPARCLE 2 compared to SPARCLE 1, whilst for two features more individuals needed the feature. These differences corresponded to the expected needs of older individuals.

Of more importance is the availability of needed features. In interpreting the findings it should be born in mind not just that the age group in SPARCLE 2 is older with some needs that will have changed; but also that five years elapsed between the capture of the environmental features and policy on environmental provision may have changed. There is considerable unavailability of needed features at both age points. Nine features in SPARCLE 1 and six features in SPARCLE 2 were available to less than half the children who needed them.

The older age group would be seeking more independence and less involvement of parents. Also, increasing body size would require some changes in the needed environment. It was encouraging to see that there was indeed higher availability in SPARCLE 2 for enlarged rooms, adapted toilets and hoists at home, adapted toilets and lifts at school, an adequate vehicle, and grants for home modifications. It was discouraging that four features appeared to be less available for the older age group – specifically walking aids, communication aids at home and school, and family availability to supervise young person for a few hours – although it was unclear

#### Physical environment

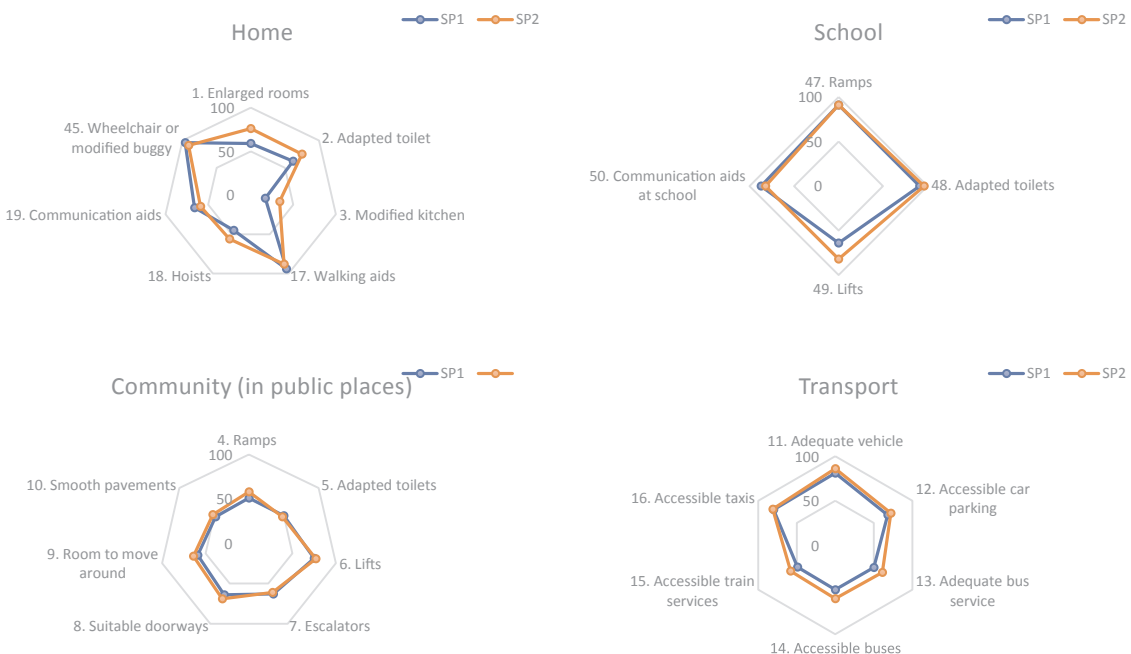


Fig. 1. Summary of the availability (number having needed feature available/Number needing feature (%)) to the ECEQ items from the 594 individuals in SPARCLE 1 (SP1) and SPARCLE 2 (SP2).

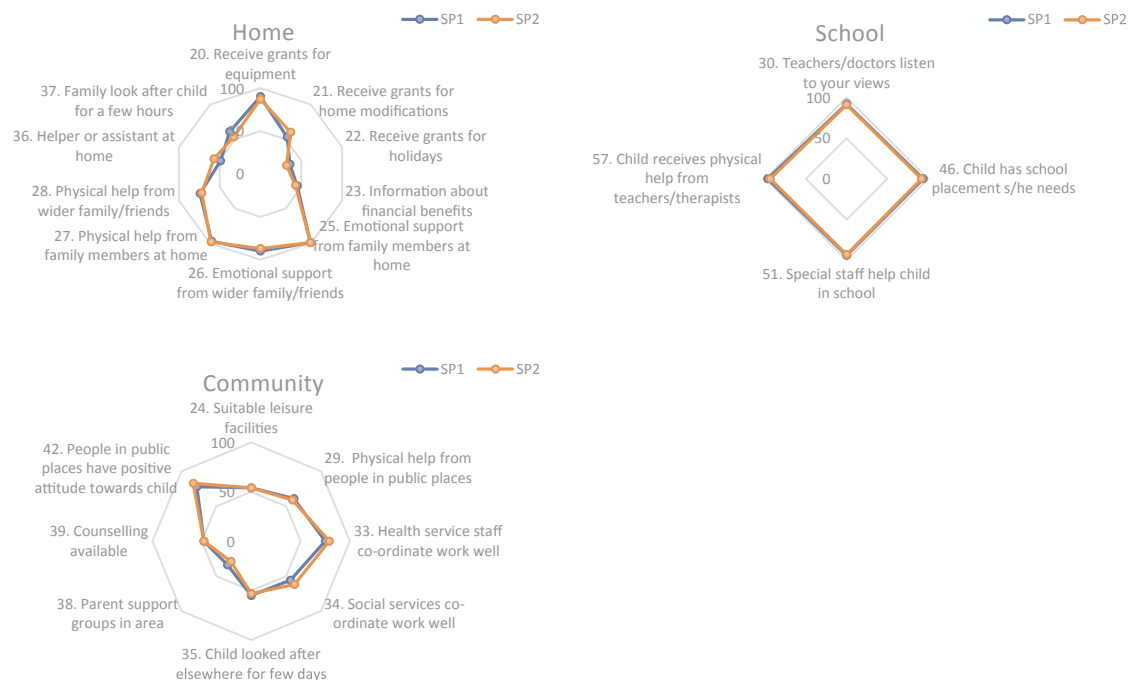
*Social support*

Fig. 1. (continued)

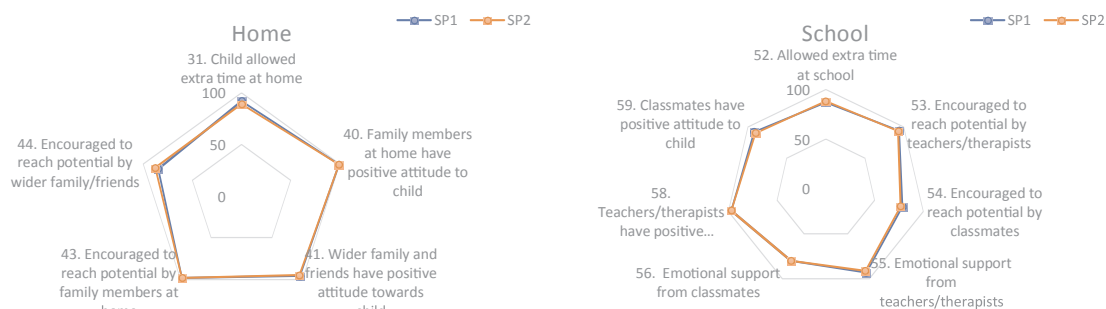
*Attitudes*

Fig. 1. (continued)

whether this reflected a change in the children reporting in SPARCLE 1 and SPARCLE 2.

There were striking differences between the regions in terms of the availability of needed environmental features. We had recognised this variation in the SPARCLE 1 study (Colver et al., 2011) but our current analysis shows that these differences persist in the older age group and the relative rankings of the better and less good regions are very similar.

#### 4.2. Strengths and limitations

Regarding the strengths of the study, the sample was based on random sampling from population-based registers. The face validity of ECEQ is strong, and the proportion of missing data was very low.

Regarding limitations, conceptualization and measurement of environmental need further refinement. The ECEQ captures the family's perception of what in the environment is needed and available to them. However, evidence to change government legislation or regulation may need more objective descriptions of what is present in the environment of a region.

The ECEQ was completed by parents. This meant we had a common metric for all the young people at both ages, including those unable to self-report. The disadvantage was that adolescents who could self-report might have provided more reliable information, especially in their school and community settings.

**Table 3**  
Rank position (RP) by region and ECEQ domain of the availability of needed environmental features in SPARCLE 1 (SP1) and SPARCLE 2 (SP2).

	East Denmark		Southeast France		Southwest France		Northwest Germany		Southwest Ireland		Central Italy		West Sweden		North England		Northern Ireland	
	SP1	SP2	SP1	SP2	SP1	SP2	SP1	SP2	SP1	SP2	SP1	SP2	SP1	SP2	SP1	SP2	SP1	SP2
Overall RP	2	4	9	9	7	7	6	6	5	5	8	8	4	2	1	3	3	1
Physical environment RP	3	4	7	7	9	8	5	5	6	6	8	9	2	1	1	2	4	3
Home RP	1	1	8	9	9	8	3	3=	7	6	6	7	5	2	2	3=	4	3=
School RP	5	5=	1=	5=	6=	7	8	8	6=	3=	9	9	1=	2	3	3=	4	1
Community RP	4	6	8=	5	6=	8	8=	7	5	4	6=	9	1=	1	1=	2	3	3
Transport RP	2	3	6	4=	9	4=	4	6	5	8	7=	9	1	2	3	1	7=	7
Social support RP	1	5	7	8	8	7	6	6	5	3	9	9	4	2	3	4	2	1
Home RP	5	6	8	8=	7	7	2=	5	4	4	9	8=	6	2	1	3	2=	1
School RP	1	5	7=	6	7=	9	9	7	4	2=	6	8	3	2=	5	4	2	1
Community RP	1=	2=	7	7=	9	7=	5	6	6	1	8	9	1=	2=	4	4	3	5
Attitudes RP	4	4=	9	9	6=	4=	8	8	3	3	6=	6	5	7	2	2	1	1
Home RP	2	7	9	9	5	4	8	8	4	2	6	3	7	6	1	5	3	1
School RP	3	3	9	9	7	4=	8	8	2	4=	6	6	4=	7	4=	2	1	1



### 4.3. Comparison with other studies

Most studies of unmet environmental needs concern unmet health needs which of course includes availability or otherwise of therapeutic and medical services and equipment. [Howie et al. \(2012\)](#) found that in 103 adults with intellectual disability, only 39% had exercise equipment available, 40% had sports equipment, and 15% had a bicycle in the home environment. Another study, ([Nieuwenhuijsen et al., 2008](#)) of 27 young adults with CP without severe learning difficulties, reported unmet needs mostly on information (79%), mobility (66%) and health care (66%). Participants with lower levels of gross motor functioning had more unmet needs and visited various health care professionals more than those with higher levels of gross motor functioning. [Jackson, Krishnaswami, and McPheeters \(2011\)](#) analyzed data from the US National Survey of Children with Special Health Care Needs, 2005–2006. They compared children with CP to children with other disabling conditions. Having CP increased the odds that children had unmet health care needs. Further, children with CP and associated medical conditions had increased odds of unmet health care needs in comparison to children without those problems.

Using the ECEQ, [Forsyth et al. \(2010\)](#) found significant variations in environmental availability for families with a child with severe impairment within Britain, determined by locality of residence (clustering in urban areas) and severity of impairment but not socio-economic status. Whilst we found no other studies of variations in environmental availability between countries, [Fulda, Johnson, Hahn, and Lykens \(2013\)](#) found considerable variation in availability of health services for those with special needs across the regions of the United States.

### 4.4. Implications for clinical practice

Our study identified environmental features that are often unavailable and reports changes between childhood and adolescence.

Early studies of interventions to make needed environmental features more available show increases in community participation ([Law, Anaby, Imms, Teplicky, & Turner, 2015](#)) and social participation ([Anaby, Law, Majnemer, & Feldman, 2016](#)).

Who might promote such environmental interventions? The emerging perspectives of the occupational therapy role and the concept of participation can potentially expand the scope and vision of the occupational therapy profession. A qualitative study of occupational therapists ([Anaby, Law, Teplicky, & Turner, 2015](#)) revealed there is interest in the broad aspects of the environment that can serve as barriers or facilitators to youth participation. The barriers can be targeted and modified effectively by using the principles of ‘Pathways and Resources for Engagement and Participation’ with steps: i) make goals; ii) map out a plan; iii) make it happen; iv) measure the process and outcomes; v) move forward ([Law et al., 2015](#)). However, research with clinicians who had implemented a different environment-based approach (context therapy) revealed that clinicians did not perceive it as “true” therapy if “hands-on” treatment was not provided ([Darrach et al., 2011](#)).

### 4.5. Implications for policy

The rankings of the better and less good regions were very similar in both age groups. Such persisting differences probably result from the different policy, legislative and statutory frameworks in each country. Committed policies are needed to ensure, through the removal of social, physical and attitudinal barriers, the full accessibility of people with severe impairment. For instance, Denmark, Sweden and Germany provide transport to take children to after-school clubs and other social events. Also, Denmark has a public system of after-school clubs, attended every day by most children up to age twelve years, whether disabled or not ([Tisdall, 2006](#)).

### Conflicts of interest

The authors declare that they have no conflicts of interest.

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