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# **An international comparison of patterns of participation in leisure activities for children with and without disabilities in Sweden, Norway and the Netherlands**

## **Introduction**

Articles 23-30 of the 2006 United Nations (UN) convention on the rights of persons with disabilities declare that children with disabilities should be able to participate on the same terms with others in education, family life, health maintenance, sports and leisure activities [1]. Fauconnier et al. (2009) showed, in a cross-sectional European study of children aged 8-12 years with cerebral palsy (CP), that differences in leisure activity patterns of children with CP exist between European countries [2]. One third of the variance could be ascribed to variation between countries. Certain characteristics of the residential country can be a potential source to differences in participation in leisure activities of children with disabilities. However, differences between countries may also exist for children without disabilities. Comparing children with and without disabilities in different countries provides crucial information on the natural variation between countries and potential differences only present for children with disabilities. Such knowledge may provide insight into how regulations and legislation promote or hinder the accessibility of persons with disabilities to leisure activities.

Participation is defined as a person's involvement in a life situation, and can be seen as a result of the interaction between a person and the environment [3, 4]. Through participation in leisure activities, children are likely to express higher levels of well-being, learn new skills and competencies, obtain experience of how society works, and have increased opportunities to build friendships [5-7]. Physical leisure activities will help the child to improve functional skills, and are linked to health benefits [8-11]. Studies have shown that participation in organized out-of-school leisure activities can benefit a child's academic outcomes, emotions and behavior [6, 12-14]. Children with disabilities often meet restrictions

in their participation due to both personal and environmental factors [5, 15-20]. Pain, mobility problems, communication disorders, and intellectual disabilities are examples that can reduce participation [17, 21-23].

For both children with and without disabilities personal factors such as age and gender have an impact on the patterns of participation in leisure activities, and when the children enter adolescence the patterns change [24-27]. Participation in skill-based activities decreases, while participation in social activities increases [25-28]. Furthermore, gender differences arise, with girls spending more time in social and skill-based activities than boys. Boys, in contrast, tend to prefer physical activities [5, 12, 27-29].

Environmental factors influencing participation can be related to both the immediate environment of the family and to the wider social environment of the child. The educational level of the parents is related to children's participation in skill-based and physical activities [5, 16, 22, 24, 26, 30, 31]. It is probable that environmental factors have different impacts on the child's pattern of participation in different cultures [2, 32-34]. The way in which children spend their leisure time may vary across countries, influenced as it is by differences in municipal resources, public services and societal and parental expectations [32, 35, 36]. The school structure and school context also influence the child's participation level [6, 37-39]. There is a growing consensus that children with disabilities should be educated within mainstream school settings to emphasize inclusion [4, 30, 36].

Specific environmental factors that have been recognized as obstacles for participation in leisure activities are the social and the physical environments, problems with transportation, fewer municipal resources and public services [2, 15, 22, 23, 35, 36, 40]. Another environmental factor of importance is population density of the child's living area, children and adolescents from rural districts tend to spend more time doing outdoor games, sports and domestic chores, whereas children in urban areas spend more time in organized

sports, in designated play areas or specialized institutions where they are transported by an adult to play and be physically active [29, 41, 42].

The Children's Assessment of Participation and Enjoyment (CAPE) is a self-reported measure of participation assessing the number of leisure activities done and the intensity of the involvement [28, 43]. In this study, the CAPE's diversity and intensity dimensions have been used to systematically study the participation in leisure activities of children with and without disabilities in three European countries.

The objective of this study was to investigate whether participation in leisure activities varies of children with and without disabilities living in Norway, Sweden and the Netherlands. Another objective was to investigate how much of the variation in participation in leisure activities that could be explained by environmental variables, after controlling for personal variables.

## **Methods**

### *Instrument*

The CAPE is a self-reported measure consisting of 55 leisure activity items. It is appropriate for children and adolescents with and without disabilities from 6 to 21 years. The CAPE measures five dimensions of participation: (a) Diversity (the number of activities done in the past four months); (b) Intensity (the frequency of participation measured as a function of the number of possible activities within a category) ranging from 1, which corresponds to once in the past four months to 7, which corresponds to once a day or more often); (c) With Whom (with whom the child performs the activity most often); (d) Where (where the child performs the activity most often); and (e) Enjoyment (how much the child enjoys doing the activity). These five dimensions of participation each provide three levels of scoring: (I) overall participation score, (II) scores of participation in 15 formal and 40 informal activities, and (III) scores reflecting participation divided in five activity types: recreational (12 items),

active physical (13 items), social (10 items), skill-based (10 items) and self-improvement activities (10 items). In this study, data distributed by activity types were used concerning diversity and intensity. Several studies have provided indications of reliability and validity of the CAPE outcomes, including studies from Sweden and the Netherlands [28, 43-47]. As the original CAPE questionnaire is in English, forward and backward translations according to international guidelines were carried out in the different countries and conducted according to the license agreement approved by the publisher.

### *Sociodemographic Variables*

Age and gender characteristics were available for all children. Living area was characterized by the number of people living in the residential town. Towns with less than 20,000 residents were characterized as 'rural', towns with more than 20,000 residents were characterized as 'urban'. For the Dutch children, the number of residents was determined using postal codes from their home town and a database from Statistics Netherlands and parental educational level was assessed during a phone interview with the parents. For the Norwegian and Swedish children, the number of residents was assessed using the postal code of their residence or the schools and habilitation centers they were recruited from. By using data from Statistics Sweden and Statistics Norway, the corresponding number of residents was determined. The parental educational level was aggregated as 'non-university level' or 'university level' based on the study questionnaire for the Norwegian parents, and on the reports of the parent's occupation obtained from a data base from Statistics Sweden.

### *Procedures*

A cross-sectional analytic design was applied. Somewhat different data collection methods were used in the different countries. In Sweden, the CAPE was performed with 55 children with disabilities aged 6 to 16 years old ( $M = 11.7$  years,  $SD 2.0$ ), recruited from 13 habilitation centers situated in rural and urban areas in the central part of Sweden. All the

participants filled in the CAPE questionnaire at home with help from parents when needed (Ullenhag et al. submitted). In addition, 337 typically developing children aged 6 to 17 years ( $M = 12.0$ ,  $SD 2.0$ ) responded to the CAPE. The children were recruited from six regions/schools situated in the central part of Sweden, including coastal and snowy landscapes, rural and urban areas, and different socioeconomic districts. The children completed the CAPE questionnaire in the classroom with one of the researchers available to answer questions. The youngest children (aged 6-7 years) completed the CAPE questionnaire at home, in case they needed the assistance of a parent [47].

The 149 Norwegian children with disabilities aged 8 to 18 years ( $M = 11.9$ ,  $SD 2.6$ ) who participated were recruited during their rehabilitation period at Beitostølen Healthsport Center (BHC). The physiotherapists working at BHC delivered the CAPE to the families. All the participants answered the CAPE questionnaire together with their families, and a physiotherapist was available to answer questions. A total of 104 typically developing children aged 7 to 14 years ( $M = 11.1$ ,  $SD 2.5$ ) also participated. These children were recruited from five schools situated in urban and rural areas of southeastern Norway with different socioeconomic districts. The children completed the CAPE questionnaire in the classroom with one of the researchers and the teacher available to answer questions).

From the Netherlands, 74 children with disabilities participated aged 6 to 18 years ( $M = 12.0$   $SD 3.4$ ). The children were recruited from two schools for special education and from a rehabilitation centre. The children were eligible if they were able to complete the CAPE with or without assistance. The CAPE questionnaire was completed in school or at home in a one-on-one session together with a research assistant. A convenience sample of 158 children without disabilities aged 6 to 18 years ( $M = 11.0$   $SD = 3.1$ ) was recruited from Dutch regular schools in different regions of the Netherlands. Children younger than 12 years completed the CAPE in a one-on-one session with a research assistant. Children aged 12 to 18

years filled out the CAPE in the classroom with a research assistant available for assistance if needed [45].

### *Ethical Considerations*

The Regional Committee for Medical Research Ethics, in Uppsala, Sweden approved the study of Swedish participants Reference No. 2008/394. The Norwegian study was approved by the Regional Committee for Medical Research Ethics, South -East Norway (REK-South East-A no: S-08658a), and the Data Inspectorate (no: 20095). The University Medical Center Utrecht, in the Netherlands and the management of all participating local schools approved the Dutch study. For all children, informed consent was given by parents and children.

### *Data Analysis*

Participants were grouped by age, gender, country of residence, the mothers' level of education, rural or urban living areas. The analyses were based on the sum of diversity scores for each of the five activity types. To simplify the analysis, the original eight CAPE categories of intensity were merged into three new categories representing low, regular or high intensity of participation in leisure activities; (i) *Seldom/never* (original intensity scale 0 = never, 1 = once/4 months, 2= twice/4 months), (ii) *Regularly* (original intensity scale 3 = once/month, 4 = 2-3 times/month) and finally, (iii) *Often* (original intensity scale 5 = once/week, 6 = 2-3 times/week, and 7 = once /day or more often).

The overall percentage of activities done seldom/never, regularly and often of five activity types were calculated for each participant as follows; The number of activities done in each category, seldom/never, regular or often was divided by the total number of activities in each activity scale and the ratio was multiplied by 100. For example if one child

had done three of 13 recreational activities often, the overall percentage of recreational activities done often was  $3/13 \times 100 = 23\%$ . The use of percentages instead of absolute numbers enabled comparison of five activity types with different numbers of items.

One- way between-groups analysis of variance tests (ANOVA) were conducted to explore the impact of country of residence on the percentage of activities done: seldom/never, regularly and often, and on diversity, for each of the five activity types. *Post-hoc* comparisons using the Tukey test were performed when a significant difference between groups was present. The one- way between-groups ANOVA was also used to analyze if there were significant differences between the three countries regarding age. Chi- squared analyses were calculated to analyze if differences existed between the countries regarding, gender, the educational level of mothers and the geographical area of living.

Hierarchical multiple regression analysis tests were used to assess the ability of the three independent environmental variables: educational level, geographical living area and country of residence, to predict the outcome scores of diversity and intensity in five activity patterns of participation, after controlling for the influence of the personal variables age and gender. The rationale for using hierarchical regression analysis was to evaluate personal and environmental factors separately, as personal factors are less context-dependent. Since the personal factors; age and gender are known to influence the pattern of participation in leisure activities regardless of nationality it was of interest to evaluate if environmental factors could further explain the variance of participation. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, multi-co-linearity and homoscedasticity. Age and gender were entered in Step 1, while educational level, geographic area and country of residence with dummy variables for each country were entered in Step 2. Statistical analyses were performed using the SPSS for Windows software program (version 19.0), and the chosen alpha level for all analyses was  $p = 0.05$ .

## Results

### *Demographic Differences*

Demographic variables are described in Table I and Table II. For children with disabilities, no significant differences were found between the three countries except for differences in rural or urban living areas. A significantly higher proportion of children with disabilities from Sweden (73%) and the Netherlands (80%) were living in urban areas compared to the Norwegian children (48%) with disabilities  $X^2(2, n = 275), p = .000$ .

For children without disabilities there were significant differences in educational level of the mothers  $X^2(2, n = 429), p = .007$  and in the geographical living area  $X^2(2, n = 586), p = .000$ . A significantly higher percentage of the mothers in Sweden (43%) and in Norway (38%) had a university education compared to mothers in the Netherlands (26%). There was a significantly higher proportion of the Swedish children (77%) living in urban areas compared to children in Norway (52%) and in the Netherlands (55%).

Insert Table I and Table II about here

### *Differences between Countries in Diversity Outcome*

One-way between-groups ANOVA indicated significant differences due to country of residence on the diversity of activities in the five activity types for children with disabilities. *Post hoc* comparisons showed that the Norwegian and Swedish children with disabilities performed a significantly higher number of activities than the children from the Netherlands in all activity types, except for recreational activities. In recreational activities there was a significant difference between Norway and the Netherlands with the Norwegian children participating in a higher number of activities (Table III).

*Insert Table III about here*

For children without disabilities, Swedish and Norwegian children participated in a higher number of social activities than children from the Netherlands. On the other hand, the Dutch children participated in a higher number of recreational activities than children in Sweden and Norway. No significant differences were found in the other activity types (Table IV).

*Insert Table IV about here*

#### *Differences between countries in Intensity Outcome*

*Seldom/never.* The ANOVAs revealed significant differences in intensity never/seldom of children with disabilities due to country of residence. Children in the Netherlands more commonly performed recreational activities seldom/never (47%) than children with disabilities from Norway (39%),  $p < 0.05$ . Children from the Netherlands to a higher degree participated seldom/never in physical, social, skill-based and self-improvement activities compared to Norwegian and Swedish children with disabilities,  $p < 0.05$  (Table III).

For children without disabilities, *post-hoc* comparison revealed that the children from the Netherlands more commonly participated in social activities seldom/never than Swedish and Norwegian children. In physical activities, children from the Netherlands participated more seldom/never compared to Swedish children. The opposite were found concerning recreational activities, where children in Sweden and Norway participated more seldom/never than children in the Netherlands. There were no significant differences in the other activity types due to country of residence (Table IV).

*Regularly.* Significant differences were found due to country of residence in intensity regular. A *post-hoc* comparison revealed that Swedish and Norwegian children with disabilities participated in a significantly higher percentage of the recreational, physical,

social, skill-based, and self-improvement activities regularly than children from the Netherlands (Table III).

Among the children without disabilities, Swedish children participated in a higher percentage of recreational activities regularly compared to the Norwegian children, and they also participated in physical activities more regularly than children from Norway and the Netherlands. Further, the children from the Netherlands participated in a higher percentage of social activities regularly than the Norwegian children (Table IV). No significant differences were found due to country of residence in the other activity types.

*Often.* The ANOVA revealed significant differences in intensity often due to country of residence. Swedish and Norwegian children with disabilities participated in a significantly higher percentage of the social activities often than children with disabilities from the Netherlands. In self-improvement activities, Norwegian children participated in a higher percentage of the activities often compared to children in the Netherlands. No significant differences were found in recreational, physical and skill-based activities between the children due to country of residence (Table III).

Children without disabilities from the Netherlands performed a higher percentage of the recreational activities often compared to children from Sweden and Norway. However, in social activities the pattern was reversed. The children from Norway participated in self-improvement activities more often than Swedish children. No significant differences were found in physical and skill-based activities between the children due to country of residence (Table IV).

*Personal and Environmental Variables Predicting Outcome Scores of Diversity*

The environmental variables hypothesized to have an effect on the diversity scores in the five activity types were: the educational level of mothers, geographic living area and country of residence. The personal variables age and gender were added as control variables in the hierarchical regression models. After controlling for the personal variables of children with disabilities, the environmental variables in could additionally explain a significant proportion of the variance in all activity types except for recreational activities. The total variance in diversity scores explained by the environmental variables varied between 12.0% and 26.7%.

For children without disabilities the environmental variables in the hierarchical multiple regression analysis explained less of the variance, 8.3%-12.7% of the diversity outcome scores of five activity types. The environmental variables significantly explained the variance in recreational, social and skill-based activities after controlling for age and gender. The main predictor was the same for both children with and without disabilities in all activity types except for in self-improvement activities. In recreational, physical and skill-based activities, personal variables mainly contributed to the diversity. Age was the main predictor in recreational activities and gender in physical and skill-based activities. The environmental variable country of residence was the main predictor in social activities and also in self-improvement activities for children with disabilities. Gender was the main predictor in self-improvement for children without disabilities. Results in detail are presented in Table V and in the appendix.

*Insert Table V about here*

#### *Personal and Environmental Variables Predicting Outcome Scores of Intensity*

Overall, the hierarchical multiple regression analysis showed that the personal and environmental independent variables could explain 8.2% to 26.7% of the variance of intensity

(activities done seldom/never, regular or often) in the five activity types for children with disabilities. The environmental variables, could best explain the variance in activities done seldom/never and regularly. The country of residence was the main predictor in 9 of 15 (60%) intensity activity types, and the strongest predictor in all activities done on regularly basis and in social and self-improvement intensity outcome scores. Age was the strongest predictor in recreational activities, and gender was the strongest predictor in physical and skill-based activities. Results in detail are presented in Table VI and in the appendix.

For children without disabilities the hierarchical multiple regression analysis could predict less of the variance, between 3.2% and 14.9 % of intensity scores in five activity types.

Results in detail are presented in Table VI and in the appendix.

The environmental variables could best explain the variance in activities done seldom/never. Gender was the strongest predictor in 9 of 15 (60%) intensity activity types, and the main predictor in physical, skill-based and self-improvement activities. Country of residence was the main predictor in recreational and social activities. In summary the same main predictors could explain the greater part of the variance in physical, social and skill-based activities for children with and without disabilities. In general, the environmental variable, country of residence was more frequently the main predictor in intensity outcome scores for children with disabilities; while for children without disabilities the personal variable, gender was most often the main predictor in diversity and intensity outcome scores.

*Insert Table VI about here*

## **Discussion**

The results of this study indicate that there are differences between countries in patterns of participation in leisure activities for children with disabilities both regarding diversity and intensity. For children without disabilities there were mainly differences between the countries in recreational and social activities. The results show that the environmental variable, country of residence, was the strongest predictor of variance in all activity types performed on a regular basis for children with disabilities. This concerned both the diversity- and the intensity outcome scores, in particular in social and self-improvement activities. On the contrary, for children without disabilities fewer differences between the countries were found and mainly in recreational physical and social activities.

In general, Scandinavian children with disabilities appear to have a higher level of participation in leisure activities compared to the Dutch children with disabilities. These results are in line with the cross-sectional European study of participation in children aged 8-12 years with CP, where children from Denmark had the highest level of participation [2]. The reason for the differences cannot be determined from this study alone, but the most prominent difference between the Scandinavian countries and the Netherlands regarding children with physical disabilities may concern the education systems. Studies have shown that children with disabilities educated within mainstream schools have a higher level of participation in some recreational activities compared to children in special schools [2, 4, 30]. There is also evidence to suggest that to include children with disabilities in regular classes increases their opportunities to gain the same social participation and theoretical knowledge as children without disabilities [30, 37, 48]. In Sweden and Norway, children with disabilities are by law [49, 50] included into mainstream schools, and only children with blindness, deafness, mental retardation (IQ level below 70), autism or similar conditions [49, 50] are segregated into special schools. In the Netherlands, 62% of the children with special

educational needs attend segregated schools, compared to less than 4% in Norway and Sweden (SNE Country data, 2010) [51], which may be one of the explanations of the differences in the participation level. In addition, the administration of the CAPE requires that the activities are done outside of the school curriculum. This might indicate that the Dutch children with disabilities participate in corresponding activities such as swimming, horseback riding etc., during the school hours, and since the activities are within the school curriculum they will not be registered as leisure activities in the CAPE. Another factor that may affect the results concerns the cultural applicability of the item content in the CAPE.

Other explanations of the differences in the participation patterns might be that Sweden and Norway have public after-school recreational centers attended all weekdays by both children with and without disabilities [36, 52]. These centers provide the children with opportunities to be engaged in social and recreational activities. Transportation and accessibility may be obstacles for participation in leisure activities for children with disabilities. Sweden and Norway might have a more generous national policy of transportations for children with disabilities than other European countries, which probably facilitates participation in leisure activities (Social security Services 1997, 2002; Regulation no 290, Available transport) [36, 52]. In Sweden there are also policies for social care and support services and national resources for providing information about assistive technology. Different policies and legislation directed at assistive technology, equality of information, support and welfare services, etc., might be other important factors that influence the participation profile of children in different countries [2, 36].

For children without disabilities only minor differences between countries could be seen. Children from Sweden and Norway participated in unorganized social and recreational activities with a higher intensity and diversity compared to the Dutch children. Again, this may be an effect of different school systems. In general, the Swedish and

Norwegian children have more unscheduled out- of -school time compared to west European children, and this may partly explain the results.

Gender was the strongest predictor of variance in both diversity and intensity outcome scores for children without disabilities. This result is in accordance with other studies showing that boys perform more physical activities while girls spend more time in social and skill- based activities [5, 12, 27-29]. The pattern of societal, parental and peer expectations influence the participation in leisure activities and needs further consideration. It is of special concern that girls' participation in physical activities tends to decrease with increasing age, since involvement in physical activities is crucial for health and well-being.

A large sample of children with and without disabilities from the three countries was included in the study. Even though the inclusion criteria were comparable in all three countries, a limitation is that we cannot know if the children's functional levels, were equivalent. Studies of children with CP have reported that a lower level of functioning is correlated with lower participation level [17, 20, 23, 27]. There are studies indicating that type of disability is of less importance for the pattern of participation than severity of impairment [53, 54]. However, functional classifications for gross motor function, manual ability and communication such as the GMFCS [55], the Manual Ability Classification System, MACS [56] and the Communication Function Classification System, CFCS [57] are available only for children with CP. Evaluating if these classifications also could be used for other populations of individuals with functional limitations would be valuable. Other factors, such as social skills and autonomy [53, 54] also need further consideration when selecting assessment instruments/classifications and research methodology.

Another potential limitation of this study concerns that data collection was done by different therapists and researchers in each country, which may have introduced systematic

differences. This risk was minimized by training the involved therapists in the Netherlands and Norway. In Sweden, the children with disabilities filled in the CAPE at home together with a parent, and 53% to 81% of the families, respectively, found the CAPE intensity and diversity questions rather easy to answer. The Swedish and Norwegian children without disabilities filled in the CAPE in their classrooms with a researcher available to answer questions. However, all the participants responded to the same instrument, the CAPE has reported sufficient Inter- interviewer reliability, and the intraclass correlation coefficient for the intensity scores ranged from .66 to .83[45]

The results from this study revealed that the personal and environmental independent variables in the model could explain only 3-27% of the variance of the diversity and intensity outcome scores. These findings are consistent with similar studies by King et al., Palisano et. al. and Imms et. al. [23, 27, 38] The larger unexplained variance in this study indicates that the model requires additional determinants, such as physical accessibility, availability of transportation, community programs and the family's preferences and orientation to social and cultural leisure activities. The functional level of all the children with disabilities may also be important variables. All these factors are potential determinants that were not included in our model.

In conclusion, in this study we found that environmental variables considerably influenced the patterns of participation for children with disabilities. As environmental factors often are amenable to state intervention, further analysis of the physical accessibility, community programs and the family's preferences to social and cultural leisure activities, etc., and the causes of nationality heterogeneity are essential to provide evidence for changes to national legislation and policies that promote participation for children with disabilities.

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INSERT APPENDIX HERE

Table I  
Demography of children with and without disabilities.

	Sweden		The Netherlands		Norway	
	Children without disabilities, <i>n</i> (%)	Children with disabilities, <i>n</i> (%)	Children without disabilities, <i>n</i> (%)	Children with disabilities, <i>n</i> (%)	Children without disabilities, <i>n</i> (%)	Children with disabilities, <i>n</i> (%)
Participants	337*	55	158	74	104	149
Age						
6–8 years	35 (10.4)	14 (25.5)	51 (32.2)	20 (27.0)	8 (7.7)	34 (22.8)
9–12 years	189 (56.3)	21 (38.2)	40 (25.3)	19 (25.7)	50 (48.1)	49 (32.9)
13–18 years	112 (33.3)	20 (36.4)	67 (42.4)	35 (47.3)	46 (44.2)	66 (44.3)
Mean (min–max), SD	12.0 (6–17), 2.0	11.7 (6–16), 2.7	11.0 (6–17), 3.1	12.0 (6–18), 3.4	11.1 (7–14), 2.5	11.9 (8–18), 2.5
Sex						
Male	164 (48.7)	29 (52.7)	72 (45.6)	38 (51.4)	47 (45.2)	82 (55.0)
Female	173 (51.3)	26 (47.3)	86 (54.4)	36 (48.6)	57 (54.8)	67 (45.0)
Rural area $\geq$ 20 000	76 (22.6)	15 (27.3)	58 (36.7)	12 (16.2)	50 (48.1)	78 (52.3)
Urban area $\leq$ 21 000	261 (77.4)	40 (72.7)	87 (55.1)	59 (79.7)	54 (51.9)	71 (47.7)
Missing			13 (8.2)	3 (4.1)		
Mothers educational level less than university	119 (35.3)	19 (34.5)	25 (15.8)	45 (60.8)	60 (57.7)	76 (51.0)
University level	144 (42.7)	20 (36.4)	41 (25.9)	26 (35.1)	39 (37.5)	71 (47.7)
Missing	74 (22.0)	16 (29.1)	92 (58.2)	3 (4.1)	5 (4.8)	2 (1.3)

Table II  
Demography of children with and without disabilities.

Clinical condition/ diagnosis of children	Clinical condition	Sweden, <i>n</i> (%)	The Netherlands, <i>n</i> (%)	Norway, <i>n</i> (%)
Central Nervous system	Cerebral palsy or related	24 (43.6)	28 (37.8)	62 (37.6)
		GMFCS	GMFCS	GMFCS
	I	5 (20.8)	12 (42.9)	12 (21.8)
	II	4 (16.7)	78 (28.6)	21 (38.2)
	III	5 (20.8)	6 (21.4)	15 (27.3)
	IV	4 (16.7)	1 (3.6)	7 (12.7)
	V	0 (0)	1 (3.6)	–
	Spina bifida, spinal cord or related	8 (14.5)	6 (8.1)	16 (10.7)
	Motor delay	1 (1.8)	4 (5.4)	–
	Developmental delay	–	10 (13.5)	17 (11.4)
	Acquired brain injury	–	3 (4.1)	4 (2.7)
	Other CNS	2 (3.6)	12 (16.2)	29 (19.5)
	Musculoskeletal	Neuromuscular	5 (9.1)	6 (8.1)
skeletal		8 (14.5)	5 (6.8)	–
Other musculoskeletal		2 (3.6)	Arthritis 6 (8.1%)	9 (6.0)
Other		4 (7.3)	–	14 (9.4)
Missing		1 (1.8)		

**Table III.** Children with disabilities- diversity and intensity participation in leisure activities

	Sweden			Netherlands			Norway		
	N	Mean(SD)	Range	N	Mean (SD)	Range	N	Mean (SD)	Range
<b>No. of activities done</b>									
Recreational activities*(12)	55	7.1 (2.7)		74	6.4 (2.7)		149	7.3 (2.4)	
Physical activities**(13)	55	3.5 (2.2)		74	2.4 (1.5)		149	3.2 (1.8)	
Social activities**(10)	55	6.1 (1.8)		74	4.3 (2.0)		149	6.6 (1.8)	
Skill based activities**(10)	55	2.7 (1.7)		74	1.5 (1.5)		149	2.2 (1.4)	
Self-improvement activities**(10)	55	4.3 (1.6)		74	3.1 (1.8)		149	4.3 (1.5)	
<b>No. of activities done seldom</b>									
Recreational activities*		39.6%	0-92%		46.9%	0-100%		39.3%	0-83%
Physical activities**		72.5%	38-100%		81.4%	54-100%		75.3%	38-100%
Social activities**		38.4%	0-80%		56.6%	10-100%		40.0%	0-80%
Skill based activities**		72.4%	40-100%		84.6%	30-100%		78.3%	30-100%
Self-improvement activities**		56.3%	20-90%		71.1%	30-100%		57.1%	20-90%
<b>No. of activities done regularly</b>									
Recreational activities**		17.4%	0-42%		8.3%	0-33%		16.2%	0-58%
Physical activities**		11.5%	0-38%		3.0%	0-15%		9.5%	0-46%
Social activities**		29.3%	0-70%		17.9%	0-50%		28.0%	0-70%
Skill based activities**		8.7%	0-30%		2.3%	0-20%		5.6%	0-30%
Self-improvement activities**		15.7%	0-40%		7.7%	0-50%		12.1%	0-50%
<b>No. of activities done often</b>									
Recreational activities		43.0%	0-100%		44.8%	0-92%		44.5%	8-83%
Physical activities		15.9%	0-38%		15.6%	0-46%		15.2%	0-62%
Social activities**		32.3%	0-60%		25.5%	0-80%		38.1%	0-70%
Skill based activities		18.9%	0-50%		13.1%	0-70%		16.1%	0-60%
Self-improvement activities**		28.0%	0-50%		21.2%	0-60%		30.9%	0-80%

\* p < 0.05

\*\* p < 0.01

Recreation 12 items

Physical 13 items

Social 10 items

Skill-based 10 items

Self-improvement 10 items

**TableIV** Children without disabilities - diversity and intensity participation in leisure activities

	Sweden			Netherlands			Norway		
	N	Mean(SD)	Range	N	Mean (SD)	Range	N	Mean (SD)	Range
<b>No. of activities done</b>									
Recreational activities**(12)	337	5.8 (2.6)		158	7.1 (2.3)		104	5.9 (2.5)	
Physical activities(13)	337	4.0 (2.2)		158	3.5 (1.7)		104	3.9 (2.2)	
Social activities**(10)	337	6.1 (1.8)		158	5.3 (2.0)		104	6.3 (1.9)	
Skill based activities(10)	336	2.0 (1.7)		158	2.1 (1.5)		104	2.5 (2.0)	
Self-improvement activities(10)	337	4.0 (1.8)		158	4.3 (2.0)		104	4.4 (1.7)	
<b>No. of activities done seldom</b>									
Recreational activities**		49.9% (21.7%)	0-100%		41.1% (19.3%)	0-92%		51.2% (20.7%)	8-92%
Physical activities**		68.3% (17.6%)	13-100%		72.9% (13.3%)	42-100%		69.7% (16.8%)	23-100%
Social activities**		37.6% (17.9%)	0-100%		47.1% (20.2%)	10-90%		37.1% (19.4%)	0-100%
Skill based activities		79.0% (18.2%)	0-100%		79.4% (15.1%)	30-100%		74.8% (20.0%)	10-100%
Self-improvement activities		58.8% (18.8%)	0-100%		57.1% (20.0%)	10-100%		56.4% (16.8%)	20-100%
<b>No. of activities done regularly</b>									
Recreational activities*		16.5% (13.4%)	0-58%		14.8% (10.8%)	0-42%		12.7% (11.6%)	0-50%
Physical activities**		9.9% (10.4%)	0-62%		5.2% (6.5%)	0-31%		7.2% (7.5%)	0-31%
Social activities*		21.4% (13.8%)	0-70%		24.6% (15.3%)	0-80%		19.6% (15.1%)	0-80%
Skill based activities		4.7% (7.4%)	0-40%		4.6% (6.3%)	0-20%		6.5% (10.7%)	0-70%
Self-improvement activities		11.9% (10.9%)	0-50%		11.5% (9.9%)	0-40%		10.1% (9.4%)	0-40%
<b>No. of activities done often</b>									
Recreational activities**		33.6% (18.7%)	0-92%		44.0% (20.2%)	8-100%		36.1% (18.5%)	0-83%
Physical activities		21.8% (14.3%)	0-75%		22.0% (12.0%)	0-54%		23.2% (15.5%)	0-69%
Social activities**		40.0% (15.5%)	0-90%		28.3% (13.9%)	0-80%		43.1% (18.2%)	0-80%
Skill based activities		16.3% (16.7%)	0-100%		16.1% (14.3%)	0-60%		18.6% (17.5%)	0-90%
Self-improvement activities*		29.3% (15.2%)	0-80%		31.3% (15.7%)	0-80%		33.5 (15.7%)	0-80%

\* p <0.05

\*\* p <0.01

Recreation 12 items

Physical 13 items

Social 10 items

Skill-based 10 items

Self-improvement 10 items

## Summary of hierarchical regression analysis

Table V The strongest model and predictor of variance in diversity outcome of five activity types for children with and without disabilities explained of variance in %.

Activity type	Children with disability				Children without disabilities			
	Step 1 R <sup>2</sup>	Step 2 R <sup>2</sup>	Sig. F change	strongest variable (Correlation part <sup>2</sup> )	Step 1 R <sup>2</sup>	Step 2 R <sup>2</sup>	Sig. F change	strongest variable (Correlation part <sup>2</sup> )
<b>Recreation</b>	24%	27%	.066	Age (22.6%)	7%	11%	.000	Age (5.1%)
<b>Physical</b>	6%	12%	.000	Gender (4.5%)	7%	9%	.053	Gender (6.7%)
<b>Social</b>	2% <sup>1</sup>	25%	.000	Country NL (18.2%)	3%	8%	.000	Country NL (4.1%)
<b>Skill-based</b>	7%	15%	.000	Gender (4.8%)	10%	13%	.015	Gender (9.8%)
<b>Self-improvement</b>	2% <sup>1</sup>	12%	.000	Country NL (7.1%)	12%	12%	.754	Gender (10%)

Step 1= Age and gender Step 2= mothers educational level, rural/urban living area and country of residence as three dummy;  
SW=Sweden, NL=the Netherlands, NO=Norway. <sup>1</sup> non significant

Table VI The Strongest model and predictor of variance in intensity outcome of five activity types for children with and without

Activity type	Children with disabilities				Children without disabilities			
	Step 1 R <sup>2</sup>	Step 2 R <sup>2</sup>	Sig. F change	Strongest variable (Correlation part <sup>2</sup> )	Step 1 R <sup>2</sup>	Step 2 R <sup>2</sup>	Sig. F change	Strongest variable (Correlation part <sup>2</sup> )
<b>Recreation</b>								
Seldom/never	24%	27%	.076	Age (22.6%)	7%	11%	.003	Age (5.5%)
Regular	4%	15%	.000	Country NL (8.2%)	1% <sup>1</sup>	3%	.049	Country NO (1.4%)
Often	18%	19%	.744	Age (17.0%)	5%	10%	.000	Country NL/Age (4.1%/3.9%)
<b>Physical</b>								
Seldom/never	6%	14%	.000	Gender/living (4.4%/3.3%)	7%	10%	.022	Gender (6.7%)
Regular	0.5% <sup>1</sup>	14%	.000	Country NL (6.2%)	0.5% <sup>1</sup>	6%	.000	Country NL (4.8%)
Often	6%	8%	.172	Gender (4.8%)	8%	9%	.469	Gender (7.6%)
<b>Social</b>								
Seldom/never	2% <sup>1</sup>	24%	.000	Country NL (17.6%)	3%	9%	.000	Country NL (4.9%)
Regular	0.5% <sup>1</sup>	12%	.000	Country NL (7.8%)	3%	4%	.164	Gender (1.6%)
Often	2% <sup>1</sup>	14%	.000	Country NL (7.7%)	2%	15%	.000	Country NL (11.3%)
<b>Skill-based</b>								
Seldom/never	7%	15%	.000	Gender (4.8%)	9%	11%	.055	Gender (8.6%)
Regular	0.5% <sup>1</sup>	10%	.000	Country SW/NL (2.9%/2.2%)	2%	4%	.245	Gender (2.0%)
Often	6%	10%	.079	Gender (5.3%)	7%	9.0%	.013	Gender (6.6%)
<b>Self-improvement</b>								
Seldom/never	1% <sup>1</sup>	15%	.000	Country NL (10.0%)	12%	12%	.913	Gender (9.8%)
Regular	0% <sup>1</sup>	8%	.000	Country SW/NL (2.0%/1.8%)	2%	3% <sup>1</sup>	.597	Gender (2.0%)
Often	2% <sup>1</sup>	10%	.000	Country NL(7.8%)	10%	11%	.505	Gender (7.8%)

disability

Step 1= Age and gender

Step 2= mothers educational level, rural/urban living area and country of residence as three dummy; SW=Sweden, NL=the Netherlands,  
NO=Norway <sup>1</sup>non significant