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Predictors of Social Participation of Children with Cerebral Palsy in Primary Schools in Czech Republic

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***Abstract*—**Cerebral palsy is primarily reflected in the disorder of the development of movement and posture, which may be accompanied by sensory disturbances, disturbances of perception, cognition and communication, behavioural disorders and epilepsy. According to current inclusive attitudes towards people with disabilities implies that full social participation of children with cerebral palsy means inclusion in all activities in family, peer, school and leisure environments in the same scope and to the same extent as is the case with the children of proper development and without physical difficulties. Due to the fact that it has been established that the quality of children's participation in primary school is directly related to their social inclusion in future life, the aim of the paper is to identify predictors of social participation, respectively, and in particular, factors that could to improve the quality of social participation of children with cerebral palsy, in the primary school environment in Czech Republic. The study includes children with cerebral palsy (n = 75) in the Czech Republic, aged between six and 12 years who attend mainstream or special primary schools to the sixth grade. The main instrument used was the first and third part of the School function assessment questionnaire. It will also take into account the type of damage assessed according to a scale the Gross motor function classification system, five–level classification system for cerebral palsy. The research results will provide detailed insight into the degree of social participation of children with cerebral palsy and the factors that would be a potential cause of their levels of participation, in regular and special primary schools, in different socioeconomic environments in Czech Republic.

***Keywords*—**Cerebral palsy, social participation, Czech Republic, school function assessment.

I. Introduction

CHILDREN and adolescents with cerebral palsy (CP) represent a specific population due primarily to their physical limitations that are very often combined with other symptoms such as speech disorders, disorders of perception, lowered intellectual abilities, epilepsy, and mental and emotional instability. The most serious and distinct problems of children with CP affect motor skills, cognitive skills and speech. Through each of these areas, the child with CP establishes contact with closer and broader social environments in the manner determined by the nature of the brain damage [1]. Therefore, it is very likely that the combination of the motor disorder and cognitive dysfunction along with other potential problems limit the social participation of children with CP [2]. According to Beckung and Hanberg [3], children with CP have limited participation in everyday situations, in education, free-time and social activities. In addition to CP being a very complex medical problem, it becomes an educational problem in school age children and social problem in adolescence, as well. The issues of CP therefore extend to the family, and subsequently, to the social environment.

Current trends of assistance for individuals with CP focus on the enhancement of their participation in everyday life. Today's inclusive attitude of the majority society towards persons with health disabilities brings the requirement of full social participation of children with CP in all of activities within the family, among peers, in school, and the out-of-school environment to the same extent and level as in the case of children with intact development [4]. Nevertheless, as far as the integration of these children into the school environment is concerned, this is most often not dependent on their intellectual capacities or knowledge but on other factors, e.g. the health condition and physical abilities of the child, external barriers, attitudinal environment, environmental factors etc. [5].

As the participation of pupils with CP at school is an important indicator of their successful participation during adolescence and adulthood, it is deemed that a deeper understanding of the predictors of social participation of this population would be of great benefit towards the improvement of their quality of life. The main objective of this paper is to determine the predictors of social participation, i.e. the factors which could determine, in advance, the quality of social participation of pupils with CP in the primary schools established specifically for the pupils with special educational needs and the regular primary schools in the Czech Republic. The unique characteristic of this study is finding out the participation of the pupils in different school situations: in the classrooms, in the corridors and hallways between the classrooms, at the school playground, on their way to and from the school, when using the sanitary facilities, and in the school canteen. Each of the situations observed requires a certain level of function abilities to fulfil the demands they bring in an adequate manner. According to the information available, this is the first study which identifies the predictors of social participation of pupils with CP in Czech primary

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schools using the SFA questionnaire. The results of this study may help to detect important factors which support the effective participation of pupils with CP in regular schools.

II. Basic Concepts

A. Social Participation

Social participation represents an interaction between an individual and the physical, social and attitudinal environments [6]. According to the international classification of functioning, disability and health, social participation is defined as taking part in a life situation or life experience in relation to the level on which the person actively participates and not in relation to how much the person can or wants to participate [7].

Chen and Cohn [8] show that social participation of children includes the interaction with people in the context of the home, at school and in broader social environments and depends on the availability and attitude of the environment. Through social participation, children form friendships, gain knowledge, learn skills, and develop their own creativity and notions of the importance and meaning of life [9]. Being able to participate fully in society is particularly important for children to ensure their successful transition to adulthood and, ultimately, their independent living [10]. Also, while participation in social learning situations stimulates cognitive development, lack of opportunities to participate may slow down cognitive development [11].

Social participation in a group outside the family is of key importance for children with physical disability [12]. According to researchers throughout the world [13]-[16], the most common issues affecting the social integration of children and adolescents with CP are reported in the functioning at school with the statistically significant relation to the level of the motor disorder of the individual. Participation is an important outcome measure, which should be considered when planning services targeting children and adolescents with and without CP [17].

B. CP

The term CP includes a wide range of brain disorders resulting in the reduced value of motor function and a number of associated damages. According to Rosenbaum [18], CP encompasses a heterogeneous group of early-onset, non-progressive, neuromotor disorders that affect development of the fetal or infant brain. The Executive Committee of the American Association for CP and Developmental Neurology defined CP as a group of permanent disorders of the movement and body posture development bringing the limitation of activity caused by non-progressive damage to the brain in fetal and/or infant development [19]. Even though, according to the definition, CP is caused by non-progressive damage to the brain, there is a wide range and varying extents of lesions incurred. Motor disorders in CP are very often related to the sensory disorders, perception disorders, and disorders of cognition, communication, attention and behaviour as well as to the epilepsy and secondary muscular and skeletal disorders [11], [19].

The common data on the occurrence of CP worldwide oscillates between two to five children with CP per one thousand of children born alive. Due to the technical improvements of intensive care and the constant technological innovation in the field of medicine, an increasing number of premature infants with very low birth weight survive the earliest period of their life which, and with the prolonged life span of the general population, leads to an increased number of adults with severe and multiple forms of disability, including CP [4]. According to one of the latest research studies carried out in Australia, Canada, China, Denmark, USA, Ireland, the Netherlands, Norway, Sweden, Turkey, Great Britain and Scotland in 2013, the prevalence of children with CP in these countries on average is 2.11 to 1,000 children born or in the range from 1.98 to 2.25 children to 1,000 children born alive with the tendency to increase in the number of early born infants up to 170.5 to 1,000 children born alive [20]. Due to the frequency of this diagnosis throughout the world and in Czech Republic (prevalence in Czech Republic stated by J. Kraus in 2005) is from 1.5 to 3 per 1,000 infants born alive [21], we see that this population is not marginal in terms of their numbers [22].

III. Legislation

A. The Rights of Persons with Disabilities

The International Classification of Functioning, Disability and Health [23], defines disability as an umbrella term for impairments, activity limitations, and participation restrictions. Disability refers to the negative aspects of the interaction between individuals with health disabilities (such as CP, Down syndrome, depression) and personal and environmental factors (such as negative attitudes, inaccessible transportation and public buildings, and limited social supports [7].

Current models defining disability and health are predominantly based on the biopsychosocial approach to health disability as mentioned by the ICF, 2001 [23]. This approach is based on the presumption that disability means a situation which occurs as the result of interaction between the abilities of a person with impairment and the characteristics of the environment said person has been living in. The segments of functioning and impairment are deemed to be the results of the interaction of possibilities of the given person and the context factors (living environment factors and social factors).

In terms of education legislation, more than three decades ago, there were increasing efforts in a number of nations to integrate children with disabilities into regular school settings [24]. One of the examples of legislative regulation of the equality of opportunities for persons with impairment in the world is the Individuals with Disabilities Education Act (IDEA) that was first adopted in the USA in 1975 (at that time it was called the Education for All Handicapped Children Act) and reauthorized in 1990 and 2004. IDEA is a federal law that requires schools to serve the educational needs of eligible students with disabilities [25], [26]. According to IDEA,

pupils with developmental disorders have the right to an adequate education which emphasizes the provision of the necessary support to satisfy individual needs in an environment as free of restrictions as possible. The Act determines two main objectives: (1) removal of barriers limiting the pupils with disabilities to participate in adequate educational programs and (2) provision of efficient educational programs and assistance support [26].

B. Legislation in the Czech Republic

In 2016, an amendment to Education Act No. 561/2004 Coll. was adopted in Czech Republic, which in reaction to the equality approach to the persons with health disabilities including the UN Convention on the Rights of Persons with Disabilities (2006), introduces a new model of education for children, pupils and students with special educational needs in the country that commenced on 01/09/2016 [27]. The amended Act under No. 82/2015 Coll., on pre-school, school, secondary, upper secondary vocational and other education levels introduces into practice the substantial de-categorization of persons with disabilities and newly defines them, in the educational sense, as persons (pupils) with special educational needs. The new legislation directs attention from a specific type of disability or health category of the pupil's impairment to non-restrictive conditions of the educational and social environment in which the pupil is educated. The student with special educational needs is newly defined in the Czech school legislation as the person who needs the provision of support measures to fulfil his/her educational possibilities. The support measures are adjustments in the education of the pupil reflecting the health impairment and living conditions of the pupil and the socio-cultural environment forming the pupil. These support measures are provided by the school and educational centre free of charge in Czech Republic.

The support measures are divided into five levels according to the financial, pedagogical and organizational demand. The list of support measures in the education of children, pupils and students with special educational needs includes the consultancy assistance by the school or education counselling centre – education according to the individual educational plan – adjustment of organization, content, forms and methods of education, and evaluation and expected outputs – adjustment of conditions for the acceptance for education and completion of education – inclusion of items of special education care into the teaching – use of compensation aids, special teaching aids, special textbooks, communication systems for deaf and deaf-blind persons, Braille dot-based characters or the system of augmentative and alternative communication – use of another teacher, interpreter or transcriber – use of the assistant to the teacher etc. The combination of support measures of various types or levels for the same pupil with special educational needs is possible as well. The support measures of the higher level may only be determined if the support measures of the lower level are demonstrably impossible. Determination of the specific level of the support measure in the Czech Republic is regulated by implementation rules, namely Decree No. 27/2016 Coll., on the education of pupils with special educational needs and exceptionally gifted pupils, as amended. The task of the Czech school is to identify the special educational needs of the pupil and propose, implement and evaluate the support measures in the first (lowest) support level in an ongoing manner. If the support measures determined by the school suffice in fulfilling the special educational needs of the pupils, they are used by the school only as long as they are efficient. If the support measures determined are not sufficient or if their efficiency is low, the school contacts the education counselling centre through the legal representatives of the pupil. At the same time, the school prepares the report on the educational support stating specifically: what problem occurred in the education of the pupil, what support measures were applied and the evaluation of their knowledge and progress. The report mentioned above about the pedagogical support is submitted by the school to the education counselling centre which then performs the diagnostics. The education counselling centre carries out an assessment of the pupil's special educational needs and focuses on: the nature of difficulties affecting the education of the pupil, diagnostics by a special teacher or psychologist, current information on the on-going pupil's education, plan of pedagogical support, details of the pupil's cooperation with the education counselling centre, information provided by the pupil or his/her legal representative, possibilities of the school and assessed health condition of the pupil. The education counselling centre shall determine, based on the diagnostics: whether it is still in the school's competence to continue the support measures being used or whether the pupil becomes the client of the education counselling centre. In the case that the pupil becomes the client of the education counselling centre, this education counselling centre proposes support measures in the second to fifth level of support (Decree No. 27/2016 Coll.).

For the pupils with awarded support measures of the second and higher levels, the school prepares the individual educational plan (IEP) in cooperation with the legal representative of the pupil, the pupil himself/herself, teacher and representative of the consultancy establishments (special pedagogical centre or pedagogical and psychological counselling centre).

If the support measures provided in the regular school or classroom are not sufficient to fulfil the educational possibilities of the pupil, they may be educated in the school or classroom established for pupils with special educational needs (SEN) [27]. Such schools and classrooms have been managed according to the type of health impairment, e.g. the schools and classrooms specialized for pupils with physical (or combined) disabilities.

IV. Determinants of Social Participation of Children with CP

Numerous research used by the authors of this study supply evidence that participation in everyday activities is of key importance for the quality of life of children with CP and represents an irreplaceable presumption of adequate development of each individual.

There are different opinions in the expert literature on which determinants are decisive for (un)realized social integration of persons with disabilities into the social environment. Most frequently, the following determinants are stated: individual, school, family, peers of close and extended social environment, and overall social policy of the society in which the individual exists [28].

Many studies have proved that the level of functioning, severity of the damage, presence of cognitive deficit and age of the children with CP are closely related to their level of limited social participation [3], [13], [14], [29]-[31]. Ilić and Nikolić [32] think that the process of social integration of persons with CP is difficult or impossible due to problems with movement functions, while Rapaić and Nedović [1] state that the large variability of the movement dysfunction in the sense of type and intensity together with frequent combination with intellectual, perceptual, sensory and speech difficulties makes this population of children and adolescents unsuitable for the planning of unified system solutions in the area of educational, social and rehabilitation issues.

Voorman et al. [15] researched the level of functional activities and level of social participation of 110 pupils aged 9-13 years in the following areas: movement, personal care, housing, social life and communication; subsequently, they analysed the links between the activity and the participation and personal features and characteristics of the CP as the condition. The results obtained proved a high level of statistical interrelation between the finding of the evaluated movement function (according to GMFCS scales) and evaluated participation in the areas of movement, personal care and housing. The presence of cognitive damage and type of CP are statistically interrelated with the success in the areas of personal care and housing while the presence of the cognitive damage and epilepsy are the most significant factors affecting social participation in the areas of social life and communication.

Morris et al. [33] reported that the intellectual ability of children with CP and their movement and manual skills scores correlated with the level of physical functional performance in the local community. It is therefore highly possible that the combination of significant motor impairment and cognitive dysfunctions impose restrictions on the child's participation, as pointed out by Schenker et al. [16].

Schenker et al. [2], in their research of 148 pupils with CP aged 6-13 years, found that there are significant differences in the levels of participation and functional activities (movement, cognitive and behavioural) according to the type of CP and level of movement preservation (SFA - part 1 and part 3, and GMFCS). The levels of participation and performance of activities are lower if there is a higher level of movement damage and/or if there are additional neurological damages.

According to the five-year longitudinal study performed with the participation of 594 children (aged 8-12 years) (later adolescents aged 13 – 17 years) with CP in Europe, it was discovered that social participation in childhood is the main predictor of participation during adolescence. Three factors in childhood which occur most frequent in the families who have children with CP are as follows: pain, mental problems and stress of the parents in different stages may result in limited social participation of the adolescents [34].

Based on the above experiences, we can clearly see that children with CP are at risk for experiencing limitations in their daily and future social and personal life [31], [35], [36].

V. Participation of Children with Disabilities in the School Environment

Participation in learning situations with a group of peers offers opportunities to observe and imitate their behaviour and strategies. Also, shared discussions and negotiations can lead the participants to a higher level of understanding than they would be unable to reach by themselves [37], [38].

Research in social participation at school reveals several differences between children with spastic CP and their classmates, besides differences in motor functioning. Children with hemiplegia have specific learning disabilities more often than their peers, even if their cognitive abilities are average. In a study of 149 children with hemiplegia, one third of the children met the criteria for having a specific learning disability in reading, spelling, or mathematics, and nearly half of the children with learning difficulties had problems in two or three areas despite an average verbal IQ [39]. Learning disabilities have been shown to predict lower participation in children with CP [2].

Experts emphasize that good school results depend to a large extent on the level of the pupil's ability to perform everyday activities which allow the pupil to take part in all of the activities during the school day [40]. These functional activities relate to non-academic aspects of the school program and differ significantly from the academic activities. The academic activities mean elaboration of school work and homework which reflect the level of mastering the school program and whose primary objective is to enhance knowledge in the respective areas, i.e.: language, mathematics, artistic subjects and science. Compliance with the school program entails mastering all of the basic functional skills including the handling of books and pens, fulfilling the instructions for the preparation of the learning material, finding the information or assistance, movement in the classroom and school, satisfaction of personal needs in an adequate manner and interaction with classmates during the classes. These activities are the non-academic ones. Pupils with developmental disorders often experience difficulties in fulfilling the assigned expectations due to their physical or cognitive limitations. Non-academic activities should therefore be included in the evaluation of the pupil's abilities because the most frequent focus of the special education program is mainly the effort to reduce or compensate for these functional limitations.

The School Function Assessment questionnaire, which was applied in this research project, deals exactly with these function skills for the evaluation of the active participation of respective pupils in six different school situations through 21 non-academic school tasks in the school programme.

All the facts stated in the studies mentioned above refer to

the fact, according to the experts, that the participation in school life is an important factor of biopsychosocial development of the child as a healthy, independent individual and active member of society. Participation in everyday, school and extracurricular activities is the basis for the development of social skills and network of social support of each child while the involvement in activities with lower quality and frequency may negatively affect the establishment of social relationships and quality of life.

VI. Method

A. Participants

The sample (N = 75) consisted of 35 children from regular primary schools, and 40 from schools for pupils with special educational needs (SEN) with the diagnosis of CP. The students were from six to 12 years old (with a mean of 9.5 years), from the first to the sixth grade. Over 60% of the respondents were male (n=47), while 28 were female.

Students included in this study were attending public or private primary schools in eight areas across Czech Republic. Due to the researched areas of social participation which are a part of the everyday school life and whose performance and training requires certain cognitive structure of the subject, only respondents with an IQ higher than 40 were considered. Given that all participants have been diagnosed with CP, their motor function was tested by five degrees of the GMFCS scale as discussed below (Table I).

TABLE I
Socio-Demographic Data

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender structure of respondents					
Gender	1.00	47	62.7	62.7	62.7
	2.00	28	37.3	37.3	100.0
	Total	75	100.0	100.0	
Number of respondents by areas in the Czech Republic					
Areas	1.00	20	26.7	26.7	26.7
	2.00	3	4.0	4.0	30.7
	3.00	9	12.0	12.0	42.7
	4.00	13	17.3	17.3	60.0
	5.00	2	2.7	2.7	62.7
	6.00	26	34.7	34.7	97.3
	7.00	1	1.3	1.3	98.7
	8.00	1	1.3	1.3	100.0
	Total	75	100.0	100.0	
Number of respondents by grades					
Grades	1.00	14	18.7	18.7	18.7
	2.00	15	20.0	20.0	38.7
	3.00	15	20.0	20.0	58.7
	4.00	13	17.3	17.3	76.0
	5.00	10	13.3	13.3	89.3
	6.00	8	10.7	10.7	100.0
	Total	75	100.0	100.0	
Number of respondents in regular schools and in schools for pupils with SEN					
School	1.00	35	46.7	46.7	46.7
	2.00	40	53.3	53.3	100.0
	Total	75	100.0	100.0	
Age of respondents					
Age	7.00	9	12.0	12.0	12.0
	8.00	15	20.0	20.0	32.0
	9.00	13	17.3	17.3	49.3
	10.00	16	21.3	21.3	70.7
	11.00	8	10.7	10.7	81.3
	12.00	14	18.7	18.7	100.0
	Total	75	100.0	100.0	
GMFC - motor status of respondents					
GMFC	1.00	13	17.3	17.3	17.3
	2.00	34	45.3	45.3	62.7
	3.00	11	14.7	14.7	77.3
	4.00	10	13.3	13.3	90.7
	5.00	7	9.3	9.3	100.0
	Total	75	100.0	100.0	

Gender: 1.00- male, 2.00- female
Areas in the ČR: 1.00-Prague, 2.00-Central Bohemia, 3.00-Liberecký Regions, 4.00-Ústecký Region, 5.00-Pardubický Region, 6.00-Jihočeský Region, 7.00-Karlovarský Region, 8.00-Olomoucký Region
Grades: 1.00- first grade, 2.00- second grade, 3.00- third grade, 4.00- fourth grade, 5.00- fifth grade, 6.00- sixth grade
School: 1.00- regular school, 2.00- school for pupils with special educational needs (SEN)
Age: 7-12 years
GMFCS: from the first to the fifth grade

B. Instruments

1. The School Function Assessment (SFA) - Main Questionnaire

The adaptation of the original version of SFA [41] was carried out through translation from English to Czech and backward translation from Czech to English. According to the analysis of the validity of the questionnaire, all subscales of social participation show good reliability in a sample of this research.

This questionnaire was prepared to evaluate and measure the performance of respective function activities, which are the base for the participation in the academic and social aspects on the level of the primary schools' program, and thus, to allow the experts an insight into the abilities of pupils with various forms and levels of abilities, and consequently, preparation of individual educational programs. The questionnaire consists of three units which may be used as separate, independent scales as well. Our research determined the joint participation of each pupil separately by summarizing the participations measured in six different environments – situations (participation during the class at regular school or school for pupils with SEN, at the school playground or during school breaks, transport to and from school, use of sanitary facilities, movement between the classes and behaviour in the school canteen during lunchtime or snack breaks).

In our research, we used Part 1 and Part 3 of this questionnaire:

- The first part relates to the participation of the pupils in the different environments mentioned above and records answers of the teachers to six questions. The teacher (assistant to the teacher, psychologist or special education teacher) was asked to select one of the six offered answers within each of the questions ranked upwardly based on the parameters of participation (from 1 to 6).
- The third part of the SFA questionnaire concerns the quality of the performance of the pupil's activity and is divided into two parts: a physical part which includes 12 separate activities in respect of the participation in the physical sense, and a cognitive and behavioural part which includes nine prepared cognitive and behavioural activities. The table below shows the activities tested – areas of social participations based on the SFA questionnaire (Table II).

TABLE II
I AND III PART OF SFA QUESTIONNAIRE – MEASURED ACTIVITIES

Part Participation	Part III-Activity Performance	
	Physic Tasks	Cognitive/Behavioural Tasks
Regular Classroom	Travel	Functional Communication
Special Education Classroom	Maintaining and Changing Positions	Memory and Understanding
Playground/Recess	Recreational Movement	Following Social Conventions
	Manipulation with Movement	Compliance with Adult Directives and School Rules
Transportation	Using Materials	Task Behaviour/Completion
	Setup and Cleanup	Positive Interaction
Bathroom/Toileting	Eating and Drinking	Behavioral Regulation
	Hygiene	Personal Care Awareness
Transitions	Clothing Management	Safety
	Up/Down Stairs	
Mealtime/Snack Time	Written Work	
	Computer and Equipment Use	

In these questions, the teachers select one out of four prepared answers ranked upwardly according to the participation level (1 to 4). Data collection with the use of the SFA questionnaire is not based on the answers provided directly by the pupils. The research expects that the teachers working with the pupils have sufficient knowledge to provide information on the function of the pupils in the school environment.

2. The Gross Motor Function Classification System (GMFCS)

The GMFCS is a scheme designed for children and adolescents with CP aged 18 years and younger. The classification is made based on five levels of current performance of gross motor function in daily activities with emphasis on mobility and sitting, ranging from level I (most able) to level V (least able). The preliminary version (2007) of the 12- to 18-year-old age band of the expanded and revised GMFCS was used to classify participants over the age of 12 years [42]. The GMFCS has evidence of content construct and discriminative validity and inter-rater reliability [43]. The psychometric properties of the GMFCS have been thoroughly tested and reported, and include evidence supporting its content validity, construct validity, inter-rater reliability and test–retest reliability [43]-[45].

C. Procedure

The research was performed in the primary schools in the Czech Republic during 2016.

Data of students with CP were collected by the first author, research team and assistants. Research assistants were mostly volunteers, professionals experienced in serving children with motor disabilities who have been previously educated and received detailed formal training on how to use both the instruments. Each session took one to two hours.

TABLE III
AREAS OF SOCIAL PARTICIPATION IN RELATION TO TYPES OF SCHOOLS ATTENDED BY PUPILS WITH CP

Areas of social participation in relation to the types of schools attended by pupils with CP					
	school	N	Mean	Std. Deviation	T-test
Participation	R	35	23.74	7.70	1.21
	SEN	40	21.40	8.81	
Travel	R	35	55.91	14.21	2.03*
	SEN	40	48.02	18.74	
Positions	R	35	23.85	8.05	0.23
	SEN	40	23.35	10.34	
Recreation	R	35	39.60	7.55	2.92**
	SEN	40	32.72	11.94	
Manipulation	R	35	46.00	10.95	1.48
	SEN	40	41.40	15.15	
Using materials	R	35	70.48	16.68	1.09
	SEN	40	65.45	22.36	
Setup, clean-up	R	35	49.65	11.45	1.71
	SEN	40	44.47	14.31	
Eating, drinking	R	35	49.31	8.29	1.92
	SEN	39	44.46	12.69	
Hygiene	R	35	51.31	11.16	2.36*
	SEN	40	43.95	15.18	
Clothing	R	35	48.14	14.95	1.76
	SEN	40	41.62	16.78	
Up/down stairs	R	30	18.23	4.83	1.47
	SEN	20	16.00	5.84	
Written work	R	34	35.91	9.22	2.60**
	SEN	36	29.52	11.14	
Computer use	R	21	23.71	7.69	0.72
	SEN	17	22.00	6.59	
Functional communication	R	35	45.91	8.22	2.00*
	SEN	40	41.02	12.19	
Memory, understanding	R	35	33.48	7.24	2.14*
	SEN	40	29.27	9.42	
Soc. Conventions	R	35	41.22	8.69	3.12**
	SEN	40	34.02	10.93	
Adult direct., rules	R	35	49.77	10.96	3.13**
	SEN	40	40.82	13.39	
Task behaviour	R	35	58.28	14.42	2.66**
	SEN	40	48.75	16.30	
Positive interaction	R	35	60.91	17.55	2.63**
	SEN	40	50.45	16.80	
Behavioural regulation	R	35	38.02	8.43	2.05*
	SEN	40	33.75	9.49	
Personal care	R	35	32.57	8.81	2.56**
	SEN	40	26.67	10.81	
Safety	R	35	32.68	8.22	2.20*
	SEN	40	28.22	9.19	

$p < 0.05$ *; $p < 0.01$ **
School: R – Regular School, SEN – School for Pupils with special educational needs

The socio-demographic data (name, surname, age, place of stay, information concerning the education) were collected by the socio-demographic part of the questionnaire, reported by the teacher or psychologist and using basic school data. The answers to the SFA questionnaire were provide by the teachers, school psychologists, special education teachers and assistants and possibly other people working with the pupil in the school environment and well familiar with the pupil.

The data collection was conditioned by the approval to perform the research from the legal representative of the child (pupil) and the management of the school in which the research is to be performed. The legal representatives, school principals and teachers (participating in the research) were informed of the characteristics and objectives of the research and handling of the data collected.

The most important results provided answers to the following questions:

- Are there statistically significant differences in the social

participation of pupils with CP who attend primary schools for pupils with SEN and pupils with CP who attend regular primary schools?

- Is the social participation of pupils with CP in the school environment affected by their cognitive condition (mental disability present)?
- Is there a difference in the level of social participation of the pupils of different gender or different ages?
- Is the social participation of pupils with CP in the school environment affected by their motor condition according to the GMFCS 5-level scale?
- Is there a connection between the quality of the expressive and receptive speech of the pupil and his/her handwriting skill (graphomotor skill) and social participation of pupils with CP?

D. Statistical Analysis

The data analysis was performed in SPSS 21 program. For the purposes of this analysis, the raw scores in social participation scales were considered. In the subsequent steps, the standardized scores were used in the comparative analysis.

The following tests were used for the statistical processing in this study: T-test for independent samples, Pearson correlation coefficient, Mann-Whitney test, Kruskal-Wallis test.

First, the basic descriptive parameters of each measuring tool were calculated using the standard method: arithmetic mean and standard deviation (SD), minimum (min.) and maximum (max.) result. Cronbach's coefficient of reliability (Cronbach's alpha) was acquired through standardized scores (units). The confirmatory factor analysis was performed with the aim to confirm the expected structure of the questionnaire. Other differences in the arithmetic means of the two groups were tested by t-test for independent samples. In the case of less than 20 respondents in each group, the Mann-Whitney test was used as a non-parametric substitution. The Kruskal-Wallis test was used to compare three or more groups. The correlations between the variables were calculated using the Pearson correlation coefficient [46].

VII. Results

All of the subscales of social participation have good reliability in the sample of this research. Cronbach's alpha coefficients for all of the subscales were higher than 0.70, from 0.72 to 0.93. Inter-item correlations were satisfactory as well, in the range from 0.32 to 0.69. Confirmatory factor analysis confirmed the expected factor structure of the questionnaire.

A. Interaction of Social Participation of Pupils with CP, Types of School They Attend and Their Cognitive Condition

1. Social Participation of Pupils with CP in Relation to the Types of the Schools They Attend

Levin t-test for independent samples was used to estimate the differences in all of the areas of social participation in relation to whether the pupil with CP attends a regular school or a school for pupils with SEN. The results (reported in the table below) show that the type of school attended by the pupils with CP is an important indicator of social participation. The students attending regular schools attain better results than the pupils attending schools for students with SEN in the following areas: Travel, Recreational movement, Hygiene, Written work, Functional communication, Memory and understanding, Compliance with adult directives and school rules, Task behaviour, Positive interaction, Behaviour regulation, Personal care, and Awareness and safety (Table III, Fig. 1).

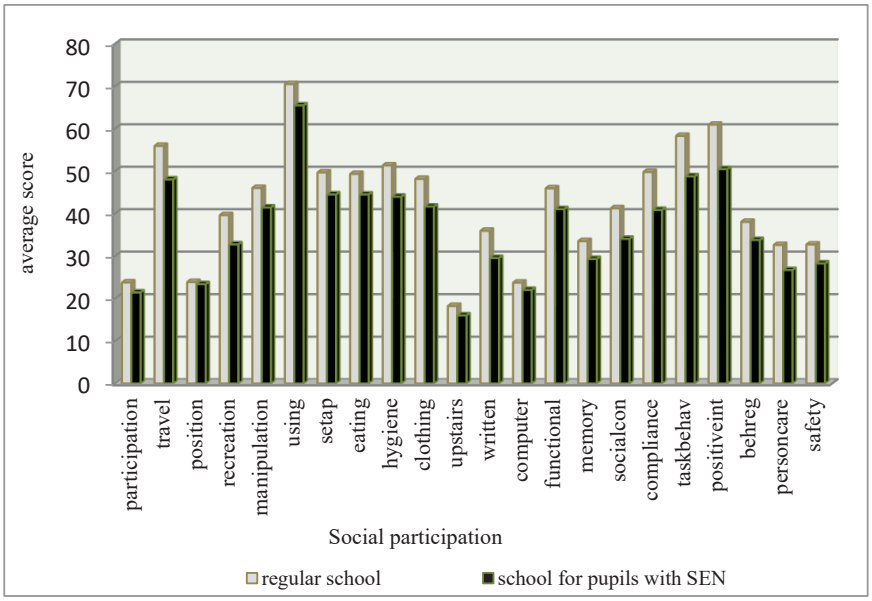

Fig. 1 Social participation of pupils with CP depending on the type of school they attend

TABLE IV
ISOLATED AND COMBINED EFFECTS OF TYPE OF SCHOOL AND INTELLECTUAL DISABILITY ON SOCIAL PARTICIPATION OF PUPILS WITH CP

Social Participation	F – school	F-ID	F-interaction
Participation	0.08	3.66	0.13
Travel	1.68	0.72	1.45
Position	0.01	0.12	0.49
Recreation	4.46*	1.13	0.21
Manipulation	0.54	1.32	0.82
Using	0.01	5.69	0.01
Setup	0.18	6.87*	0.64
Eating	0.81	3.32	0.33
Hygiene	0.71	8.82**	1.80
Clothing	0.10	8.02	1.02
Upstairs	0.02	5.76*	1.65
Written	1.29	10.84	1.70
Computer	0.10	7.56*	12.07**
Functional	0.02	20.55**	0.37
Memory	0.20	13.87**	0.93
Social conditioning	1.87	13.11**	1.87
Compliance	2.53	9.57**	0.74
Task behaviour	1.21	11.26**	0.42
Positive interaction	0.47	17.95**	2.64
Behave regularly	0.46	7.91*	0.54
Personal care	0.42	17.36**	2.45
Safety	0.06	21.00**	0.83

F – Value of f-test (F type of school, F intellectual disability).

2. Interaction of Social Participation of Pupils with CP, Types of Schools They Attend and Their Cognitive Condition (Triangle)

A relationship was determined between the types of schools (regular, school for pupils with SEN), cognitive condition of the pupils and their possible interactive effect on all the areas of social participation of pupils with CP.

The results show that there are no significant associated effects or isolated effects of the type of school and mental disability in the following domains of social participation: six areas of participation – environment/situation (first part of the questionnaire) and the performance during activities: Total participation, Travel, Maintaining and changing position, Manipulation with movement, Using materials, Eating and drinking, Clothing management and Written work (third part of the questionnaire - Table IV) There is an independent – isolated effect of the type of the school in the area of Recreation only when the pupils attending regular schools have better social participation in this area.

The independent effect of the intellectual disability on social participation of pupils with CP was observed in most of the subscales: Setup and clean-up, Hygiene, Up/down stairs, Computer and equipment Use, Functional communication, Memory und understanding, Following social conventions, Compliance with adult directives and School rules, Task behaviour/completion, Positive interaction, Behavioural regulation, Personal care awareness and Safety. This effect shows that the pupils with intellectual disability have lower scores reached in these areas of social participation.

It is worth pointing out that the combined effects of the school and the intellectual disability are reported only on the subscale Computer and equipment use with the pupils with intellectual disability in the regular school has lower scores than the pupils without intellectual disability in the school for pupils with SEN (Fig. 2). This leads us to the conclusion that an important predictor of social participation of pupils with CP in regular schools is namely the cognitive condition of the pupils and the type of school they attend on the second position. The pupils with higher intellectual level, or those pupils attending regular schools, have better social participation at primary schools according to the statistics.

B. Gender and Age of the Pupils and Social Participation

1. Dependency of Social Participation on the Pupil's Gender

Levin t-test for independent samples was used to test the gender differences in all of the areas of social participation. The results show that boys and girls with CP do not differ in any aspect of social participation in any substantial manner.

Therefore, gender is not an important predictor of social participation of the pupils with CP in the Czech Republic (Table V).

2. Age of Pupils and Social Participation

As shown in Table VI, age is not an important predictor of social participation of pupils with CP in the Czech Republic. There is no important correlation between the age of the pupil and the score in each of the social participation areas tested.

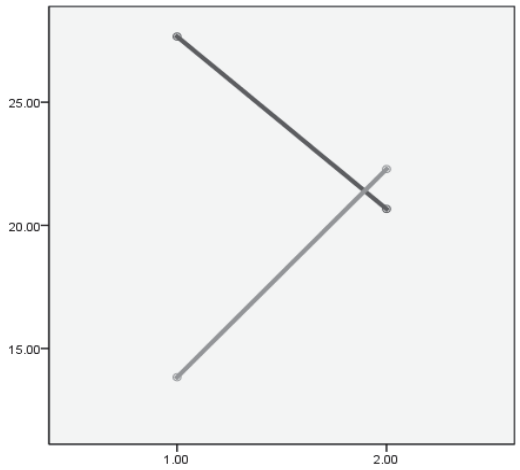

Fig. 2 Arithmetic Means of Achievement on the Subscale Computer and Equipment Use – Interaction Effect. *School:* 1- regular; 2- school for children with SEN, *Intellectual disorder:* black- without intellectual disorder; grey– with intellectual disorder

C. Ratio of Motor Functions and All Areas of Social Participation of Pupils with CP

In the research of the dependency on the accepted area of social participation in relation to the motor condition of the pupils, the results show an important correlation of GMFC value and social participation of the pupils with CP. These results confirm the fact that pupils with more impaired motor condition score worse in social participation. This rule holds

true without any exception, i.e. the gross estimate of the motor functional condition is an important predictor in all the areas of social participation of the pupils with CP in the Czech Republic. (Table VII).

TABLE V
DIFFERENCES IN SOCIAL PARTICIPATION OF CHILDREN WITH CP DEPENDING ON GENDER

	gender	N	Mean	Std. Deviation	T-test
Participation	1.00	47	22.0426	7.55259	-0.604
	2.00	28	23.2500	9.62491	
Travel	1.00	47	51.5532	15.99159	-0.100
	2.00	28	51.9643	19.22090	
Position	1.00	47	23.4894	9.21689	-0.117
	2.00	28	23.7500	9.57475	
Recreation	1.00	47	35.3404	10.22205	-0.622
	2.00	28	36.9286	11.44691	
Manipulation	1.00	47	44.0638	12.80014	0.428
	2.00	28	42.6786	14.73231	
Using	1.00	47	66.9574	19.40076	-0.471
	2.00	28	69.2143	21.12811	
Setup	1.00	47	47.9149	12.30205	0.865
	2.00	28	45.1786	14.73483	
Eating	1.00	46	46.4348	10.80669	-0.320
	2.00	28	47.2857	11.59456	
Hygiene	1.00	47	48.0000	13.62861	0.493
	2.00	28	46.3571	14.47658	
Clothing	1.00	47	44.6809	14.78411	0.010
	2.00	28	44.6429	18.59553	
Upstairs	1.00	31	16.9677	5.57664	-0.628
	2.00	19	17.9474	4.96066	
Written	1.00	43	31.9070	10.58034	-0.711
	2.00	27	33.7778	10.93805	
Computer	1.00	23	22.6957	7.10592	-0.264
	2.00	15	23.3333	7.52773	
Functional	1.00	47	43.1489	10.49219	-0.164
	2.00	28	43.5714	11.34780	
Memory	1.00	47	30.7660	8.21508	-0.610
	2.00	28	32.0357	9.51989	
Social conditioning	1.00	47	35.6383	9.88505	-1.896
	2.00	28	40.3214	11.08905	
Compliance	1.00	47	43.0213	13.20324	-1.726
	2.00	28	48.3214	12.27178	
Task behaviour	1.00	47	50.4894	15.55897	-1.925
	2.00	28	57.7500	16.19013	
Positive interaction	1.00	47	52.7660	16.45575	-1.633
	2.00	28	59.6429	19.48449	
Behave regularly	1.00	47	34.9362	8.83522	-.987
	2.00	28	37.1071	9.82189	
Personal care	1.00	47	29.3830	10.08562	-.047
	2.00	28	29.5000	10.84401	
Safety	1.00	47	29.1489	8.56174	-1.458
	2.00	28	32.2500	9.47756	

p <0.05 *; p <0.01 **

TABLE VI
CORRELATION BETWEEN AGE AND SOCIAL PARTICIPATION

Pearson Correlation		Participation	written	computer	functional	memory	socialcon	compliance	taskbehav	positiveint	behreg	personcare
Age	r	.167	.211	.046	.152	.104	.186	.258*	.209	.195	.170	.202
	p	.152	.080	.785	.192	.376	.111	.025	.072	.093	.146	.083
	N	75	70	38	75	75	75	75	75	75	75	75
		travel	safety	position	recreation	manipul	using	setup	eat	hygien	clothing	upstair
Age	r	.112	.070	.105	.169	.213	.098	.148	.224	.187	.144	-.117
	p	.337	.553	.372	.146	.067	.403	.206	.055	.108	.217	.418

D.Correlation between Expressive and Receptive Speech and Writing Skill and Social Participation of Pupils with CP in Czech Republic

The results suggest an important correlation between the expressive and receptive speech and social participation of pupils with CP. These results confirm the fact that pupils with better developed verbal communication and writing skill have better social participation, or, that writing and speech are important predictors in all the areas of social participation of pupils with CP in Czech Republic.

More detailed expressive speech and handwriting are important and positive predictors in all the areas of social participation with receptive speech being an important indicator of the subscales: Eating and drinking, Computer and equipment use, Functional communication, Task behaviour/ Completion, Positive interaction and Personal care awareness (Tables VIII-X).

TABLE VII
RATIO OF MOTOR FUNCTIONS AND SOCIAL PARTICIPATION OF PUPILS WITH CP

Pearson correlation		Travel	Safety	Position	Recreat	Manipul	Using	Setup	Eating	Hygiene	Clothing	Upstairs
GMFC	R	-.73**	-.35**	-.62**	-.77**	-.67**	-.56**	-.52**	-.55**	-.67**	-.63**	-.71**
Pearson correlation		Participation	Written	Computer	Functional	Memory	Socialcon	Compliance	Taskbehav	Positiveint	Behreg	Personcar
GMFC	R	-.60**	-.43**	-.39*	-.28*	-.28*	-.27*	-.39**	-.28*	-.26*	-.18	-.60**

p <0.05*, p <0.01**

TABLE VIII
CORRELATION OF EXPRESSIVE SPEECH AND SOCIAL PARTICIPATION

Pearson correlation		Travel	Safety	Position	Recreat	Manipul	Using	Setup	Eating	Hygiene	Clothing	Upstairs
Expres. speech	R	0.40**	0.39**	0.32**	0.44**	0.39**	0.46**	0.42**	0.59**	0.49**	0.48**	0.45**
Pearson correlation		Participation	Written	Computer	Functional	Memory	Socialcon	Compliance	Taskbehav	Positiveint	Behreg	Personcar
Expres. speech	R	0.45**	0.28	0.64**	0.44**	0.52**	0.45**	0.44**	0.50**	0.47**	0.53**	0.60**

p <0.05 *; p <0.01 **

TABLE IX
CORRELATION OF RECEPTIVE SPEECH AND SOCIAL PARTICIPATION

Pearson correlation		Travel	Safety	Position	Recreat	Manipul	Using	Setup	Eating	Hygiene	Clothing	Upstairs
Recept. speech	R	0.22	0.18	0.146	0.18	0.21	0.19	0.18	0.24*	0.18	0.21	0.18
Pearson correlation		Participation	Written	Computer	Functional	Memory	Socialcon	Compliance	Taskbehav	Positiveint	Behreg	Personcar
Recept. speech	R	0.13	0.31	0.32**	0.28*	0.31**	0.19	0.19	0.24*	0.28*	0.20	0.34**

p <0.05 *; p <0.01 **

TABLE X
CORRELATION OF HANDWRITING AND SOCIAL PARTICIPATION

Pearson correlation		Travel	Safety	Position	Recreat	Manipul	Using	Setup	Eating	Hygiene	Clothing	Upstairs
Writing	R	0.46**	0.45**	0.36**	0.46**	0.46**	0.56**	0.53**	0.60**	0.53**	0.49**	0.45**
Pearson correlation		Participation	Written	Computer	Functional	Memory	Socialcon	Compliance	Taskbehav	Positive int	Behaves regularly	Personal care
Writing	R	0.39**	0.54**	0.51**	0.49**	0.53**	0.56**	0.46**	0.47**	0.48**	0.56**	0.51**

p <0.05 *; p <0.01 **

VIII. CONCLUSION

The results presented in this paper clearly show high correlation of the personal features of pupils with CP to gaining successful social participation in primary schools. It has been shown that the cognitive variable - intellectual preservation is of the greatest importance for the full realization of social participation in primary schools.

Other individual factors influencing social participation are as follows: level of motor functioning, development of expressive speech, handwriting and, to a lower extent, development of receptive speech. Personal qualities – gender and age, do not show an important effect on the quality of social participation of these pupils in primary school according to the results of the current study.

As far as environment factors are concerned, we considered the effect according to the type of school attended by the pupils with CP and their social participation. In most of the social participation areas investigated, the pupils attending the regular primary school scored better than the pupils from the schools for pupils with SEN. This may be related to the individual characteristics of the pupil, the variety of the approach and larger possibilities the pupils with CP have available in the inclusive education in the regular schools. Therefore, we are concluding that enhancement of the personal capacities of the pupils with CP together with introducing pupils into the system of inclusive education would form the basis for the comprehensive activities aimed at the overall social inclusion of these pupils at primary schools in Czech Republic.

Naturally, more detailed research is necessary to identify the predictors and risk factors of adequate participation of pupils with CP at primary schools and to allow for their comprehensive definition. This could provide the basis for the preparation of individual support models and adequate school environment in which pupils with CP may gain academic skills and social norms, develop their own personality and gain social skills in the same manner and to the same extent as their peers with no developmental disabilities. The performed

school participation in the inclusive environment and participation at home and their peer environment provides for the confidence and incentive for an active participation in all the areas of social life which leads to the final objective of the education and rehabilitation of the pupils with CP – the maximum performed participation and social integration of persons with CP.

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