

Social Behavior in Children of Special Olympics and Non-sporty Children with Intellectual Disability

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ABSTRACT

Introduction: There is a lack of longitudinal research in the field of social behavior in children with intellectual disability (ID). The first goal of the research was to find out and compare the social behavior of children who regularly participate in Special Olympics (SO) competitions with non-sporty children. The second goal was to show the trend in the development of children's social behavior and to find out whether summer vacations have any effect on children's behavior.

Methods : The Reiss Screen Behavior questionnaire was used to determine social behavior. Participants were children with ID aged 6–20 years. A total of 4 measurements were performed over a two year period (the number of children in SO was $n = 14$, $n = 18$, $n = 18$, $n = 13$ and the number of non-sporty children was $n = 42$, $n = 40$, $n = 39$, $n = 40$).

Results: Children in SO have better social behavior by 10 % compared to non-sporty children. The trend of development in social behavior is unbalanced among children in SO, and summer vacations cause improvements in their behavior. Non-sporty children have a convex trend in social behavior and summer vacations have no effect on their behavior.

Conclusion: In children of SO, social behavior differs by 3 % from the norm of ideal social behavior. In non-sporty children, social behavior differs by 13 % from the norm. Sport in children with ID leads to fair play and improves social behavior. Overall, the behavior of children with ID is very good in the Czech Republic, as it differs very little from the norm of ideal social behavior.

Keywords: Questionnaire Reiss Screen Behavior, sport, physical activity, children, adolescents, Special Olympics, developmental trends

INTRODUCTION

Social behavior is the way we react to the social environment (to other people) and is influenced by stereotypes, attitudes, norms (Goleman, 2011, p. 43). One of the most important aspects of human life is interpersonal relationships, which are manifested in communication and mutual cooperation with other people. Relationships with our friends, co-workers, parents, children, etc. give our lives their main content and meaning (Nakonečný, 2011, p. 637). Social behavior can manifest in humans in different ways, such as prosocial behavior, antisocial behavior, altruism, aggression, etc. (Goleman, 2011, p. 44).

Research in Sweden, the United States and the United Kingdom agrees that children with intellectual disability (ID) have a high rate of behavioral problems with a prevalence of 22%–64% (Gillberg et al., 1986; Merrel & Holland, 1997; Totsika et al., 2011), and that behavioral problems are very common in children with ID (Kostikj-Ivanovikj, 2009; Lakhan, 2018).

Children with ID exhibit specific (repetitive) behavior that is not typical for children without ID due to its frequency and duration (Hodapp & Zigler, 1997). Typical behaviors include increased passivity (Linn, Goodman & Lender, 2000; McWilliam & Bailey, 1992), distracted attention, impulsivity (Kopp, 1990; Kopp, Krakow & Johnson, 1983), aggression, destructive behavior, and self-harm. At the same time, people who have highly problematic behaviors more often need more help from others, especially in looking after themselves (eating, dressing, washing), (Emerson et al., 2001). This behavior is often considered maladaptive and disruptive of their learning (Hodapp & Zigler, 1997). The degree and severity of behavioral problems is very individual (Iwata, 2006). Problem behavior is a risk factor for mainstream exclusion and social integration (Kishore et al., 2004).

Parents of children with ID perceive that the problematic behavior of their children is caused not only by ID, but also by social (difficulty understanding, limited attention) and environmental contexts (Jacobs, Woolfson & Hunter, 2015). Children with mild to moderate ID are not more likely to behave worse at school than children without disabilities, provided that their teaching is sensitive and appropriate (Bierbaum, Henrich & Zigler, 2005). Teachers rate children with ID as more disobedient than their peers with average intelligence (Zigler et al., 2002). Gender in children with ID does not show any significant correlation with any type of problem behavior (Lakhan & Kishore, 2018).

A two-year comparison of two groups of adolescents in the Czech Republic, namely participants in Special Olympics and non-sporty children, found better motor competences and social behavior among participants in SO. SO participants had a stabilized trend in motor skills and a growing trend in social behavior. On the contrary, non-sporty children had a declining trend in motor skills and a stabilized or slightly increasing trend in social behavior (Válková, 1998).

Many authors agree on the importance of physical activities on the psyche of people with ID (Winnick & Porretta, 2016, p. 5; Pitetti & Fernhall, 2004; Onyewadume, 2006). Involvement in physical activities also leads to improved coordination, visibility, recognition and thus a higher level of social status (Lahtinen, Rintala & Malin, 2007). Another benefit is the improvement of the aerobic capacity of the lungs, gross motor skills and especially the high level of satisfaction of participants in physical activity and sports (Johnson, 2009). Exercise also develops mental functions including perception, attention, memory, imagination, thinking, and speech (Kvapilík & Černá, 1990, p. 91).

There are also benefits of physical activities for people with ID in the social field. The individual comes into contact with society and develops social skills, i.e. togetherness, willingness, respect, discipline, order, and character are formed (Černá, 1985, p. 106). The integrative character of physical activities is also significant, especially gaining new friends (Svoboda, 1977). Sport has also been found to develop independence in individuals (Dlužewska-Martyniec, 2002).

In sporty children with ID, progress was found in everyday skills, i.e. in food, clothing, personal hygiene and communication. Skills improvement was greatest in younger children and was associated with a reduction in behavioral problems. However, these improvements were smaller with the sample of children without ID (Chadwick, Cuddy, Kussel & Taylor, 2005).

In developmental psychology, the assessment of development trends according to psychologist Švancara (1980, p. 20) and Válková & Thaiszová (1989) is used to monitor children and adults, who list 6 basic development trends: positive, negative, unbalanced, stable, concave, convex. Thanks to the representation of the trend, we can find out if the child has made progress, is at the same level, or is getting worse.

The significance of the research lies in the longitudinal monitoring of children and adolescents with ID. Globally, there are few longitudinal studies dealing with the social behavior of children and adolescents with ID, and in the Czech Republic, where the research took place, no such study has yet been conducted.

The first goal of the research was to find out and compare the social behavior of children who regularly participate in Special Olympics (SO) competitions with non-sporty children. The second goal was to show the trend in the development of children's social behavior and to find out whether summer vacations have any effect on children's behavior.

METHODS

The research took place over 2 years at two primary schools in the Zlín Region in the Czech Republic. The research is longitudinal and was part of the nationwide Czech Healthy Community Project (Y2-17-600-11), which ran from 2017 to 2019. The research was funded by the US Golisano Foundation and was conducted in collaboration with the Czech Special Olympics Movement. This is a completely new study in indicators of behavior of children with ID, where the progress of the same sample of children is monitored over the long term.

Children's behavior was surveyed (interviewed) a total of 4 times in each school. The survey took place in June (2017 and 2018) before the summer vacations and in September (2017 and 2018) after the summer vacations.

Participants

The participants were children from the primary school in Zlín (classification ISCED 1 and ISCED 2) and the primary school in Otrokovice (classification ISCED 1 and ISCED 2). Both schools agreed to participate in the research and cooperation agreements were signed with them. All children from both schools were offered participation in the research. Half of the parents at each school agreed to their child's participation in the research. Consent was obtained from all participating

children from their parents. The research was also approved by the Ethics Committee of Faculty of Sports Studies of Masaryk University

The research participants were children aged 6-20 years. The age composition of the children was: 40% in school-age (6-11 years), 40% in puberty (12-15 years) and 20 % in adolescence (16-20 years). Children had mild ID or moderate ID. The most of children had a simple ID (without other associated disorder such as Down syndrome, epilepsy and autism). In the following table (Table 1) we see the characteristics of children in terms of sporty and non-sporty children and in terms of gender, so that the results can be compared with other research. A total of 56 children (June 2017), 58 children (September 2017), 57 children (June 2018) and 53 children (September 2018) participated in each survey.

The time period is also divided into the months of June (surveying children before the summer vacations) and September (surveying children after the summer vacations), in which the children were interviewed. (In the Czech Republic, all children have summer vacations in August and July, for that reason the time period before and after the vacations was chosen).

Sporty children regularly participate in the sports competitions of the Czech Special Olympics Movement, such as athletics, swimming, downhill skiing, cross-country skiing. Non-sporty children do not do any sports regularly. All children have regular physical education at their school, which ranges from 2 to 4 lessons per week. As a rule, children with a moderate degree of disability have a higher number of physical education lessons, i.e 3-4 hours per week and children with a mild degree of disability have 2-3 teaching hours per week.

Table 1. Characteristics of number children in research

	June 2017	September 2017	June 2018	September 2018
Children in SO – females	8	7	7	5
Children in SO – males	6	11	11	8
Non-sporty – females	18	17	17	16
Non-sporty – males	24	23	22	24
Total children in SO	14	18	18	13
Total non-sporty	42	40	39	40

Reiss Screen Behavior Questionnaire

Social behavior was assessed using the Reiss Screen Behavior questionnaire, which is directly designed for people with intellectual disabilities. The questionnaire evaluates adaptive - maladaptive social behavior and is designed for all levels of ID. A translated and verified version of the questionnaire according to Válková (2000, pp. 15-28) is used for the Czech environment.

The questionnaire contains a total of 38 items which show characteristics of human behavior, such as aggressive, anxious, addicted, inattentive, etc. For each item, 1 of the 3 categories offered, which best describes the behavior in a person with ID, is selected. The categories are:

- Behavior is not a problem – this answer is rated 1 point
- Behavior is a problem – this answer is rated 2 points
- Behavior is a big problem – this answer is rated 3 points

A gross score is obtained by evaluating the questionnaire. The minimum number of points that each person can get is 38 points, which means completely trouble-free behavior. On the contrary, a maximum of 114 points indicates major problems and behavioral disorders, where the person should visit a psychiatrist regularly and his or her behavior should be monitored.

For a better presentation of the score results from the Reiss Screen Behavior questionnaire, the gross median scores for each category are converted to percentages (Table 4, Table 6, Table 8). The resulting values were obtained in such a way that a minimum of 38 points (completely problem-free behavior) represents 100 %. And a maximum of 114 points (major behavioral problems) represents 300 %, or behavior 3 times worse than the norm.

The questionnaire was filled in for each child by their class teacher, who spends the most time with the child at school and therefore knows the manifestations of their behavior best. Behavior was assessed for each child a total of 4 times over two years.

The validity of the results was ensured by the researcher himself (leader of the volunteer team), who participated in all the measurements at the schools and supervised the team of volunteers. In addition, standard tests from the FUNFitness program, which is part of the global Special Olympics Healthy Athletes program, were used for measurements (Special Olympics, 2022).

Reliability is again ensured by using tests from the FUNFitness program, which is part of the global Special Olympics Healthy Athletes program. And then a longitudinal investigation took place at the same schools, with the participation of the same organizational team of trained volunteers.

The process of data collection and management of the research

The process of data collection and management of the research consisted of ensuring contractual cooperation with cooperating schools, arranging the dates of questioning at each school, and obtaining consent to participate in the research from the parents of the children. As this survey makes up only one third of the research within the project, it was undertaken by a team of 10 volunteers (with previously training), and their transport to the schools and uniform T-shirts within the project were also provided.

Furthermore, before each measurement, forms (empty questionnaires) were prepared to be filled in and other small things such as writing stationery. We also provided refreshments for all project participants, i.e. children, teachers and a team of volunteers. After collecting all the questionnaires, it was necessary to rewrite the data into a computer and evaluate it.

Data processing and analysis

The data were processed in Statistica and Microsoft Excel. Based on three normality tests (Kolmogorov-Smirnov, Liliefors, Shapiro-Wilks), it was found that these are nonparametric data that do not correspond to the Gaussian curve of the normal distribution. Therefore, the median is used instead of the arithmetic mean in the presentation of results.

Because this is a measurement on the same group of children, it is dependent data. Due to the fact that a total of 4 measurements were performed, we used analysis of variance, specifically Friedman's anova, to determine the statistics of significant differences at the 5% level of significance (for values $p \leq 0,05$). In the table (Table 2) we can see that in the analysis of variance no statistically significant differences were found for the given children in the individual categories.

Table 2. Analysis of variance - Friedman's anova

Behavior	p
Children in SO	0,07580
Non-sporty children	0,04229
Children in SO - females	0,15061
Children in SO - males	0,23845
Non-sporty - females	0,08838
Non-sporty - males	0,50955

With regard to longitudinal research, each area of research was evaluated in terms of development trends according to Švancara (1980, p. 20) and Válková & Thaiszová (1989), who state 6 basic trends: positive, negative, unbalanced, stable, concave, convex.

RESULTS

The results presented are by category: all children (females and males together), only females, only males. Due to non-parametric data, the median is used in descriptive statistics.

Children in SO and non-sporty children

Comparing the development of trends in behavior (Figure 1), we see that children in SO had better behavior throughout the measurements (lower values in the questionnaire) than non-sporty children. Only in June 2018 was the behavior of both groups of children the same (40 points).

We see an **unbalanced trend** in behavior among **children in SO**, where they always have completely problem-free behavior in September after the summer vacations (score 38 points) and always have increased values at the end of June (41,5 and 40 points), which indicates a deterioration in behavior. We can therefore say that **their behavior deteriorates during the school year, and conversely their behavior improves over the summer vacations**. This change is not statistically significant, see Table 2.

For **non-sporty children**, we see a **convex trend** in behavior, where they have a different point value in each measurement. They had the worst behavior at the beginning of the measurement in June 2017, namely 47,5 points. Gradually, their behavior improved until June 2018, where they had comparable behavior to the second group (40 points) and then their behavior deteriorated to 42 points in September 2018. Given the convex trend, we can say that **summer vacations have no influence over the behavior of non-sporty children**.

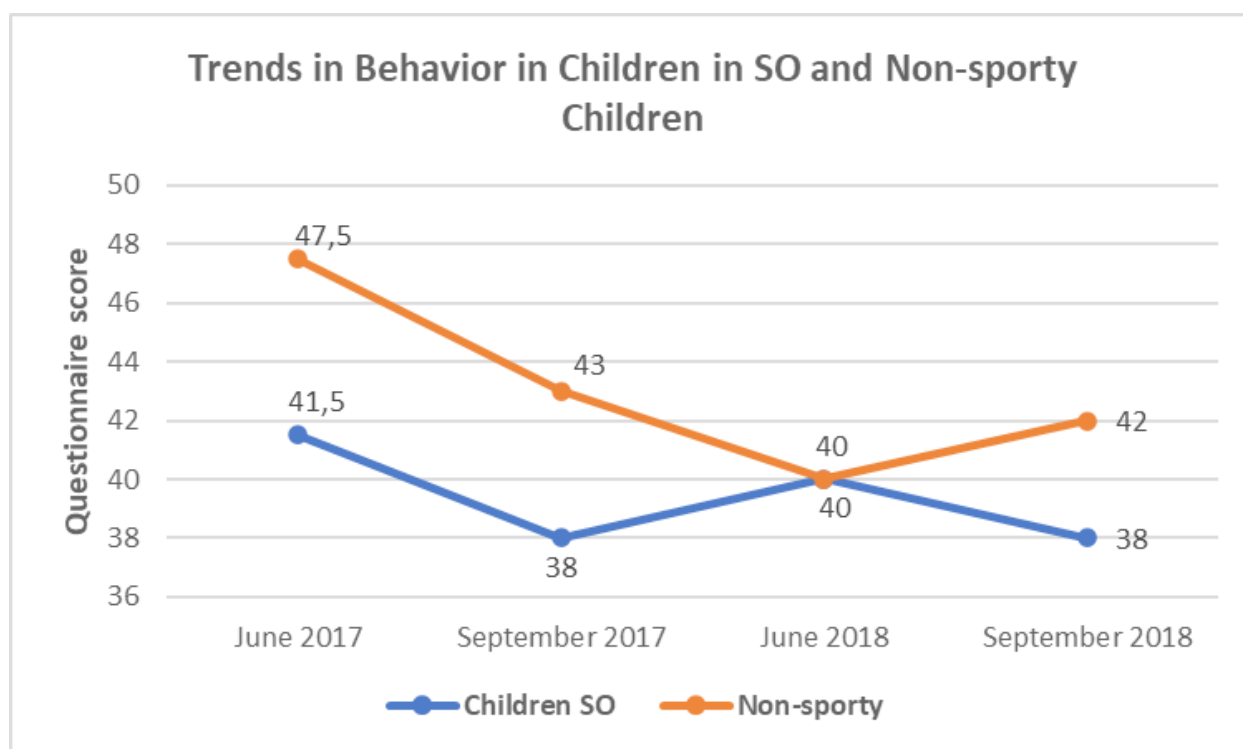


Figure 1. Graph of behavioral trends in sporty and non-sporty children

The following table (Table 3) shows descriptive statistics for the gross scores in the Behavior Questionnaire for children in SO and non-sporty children. Where, in addition to the median, the standard deviation and the minimum and maximum number of points that appeared among children in the given category are shown.

We can also notice that the maximum values for each measurement are higher for non-sporty children, i.e. they have worse social behavior.

Table 3. Gross scores in the Behavioral questionnaire for children in SO and non-sporty children

Behavior – gross score	Children in SO			Non-sporty children		
	Median ± SD	Min	Max	Median ± SD	Min	Max
June 2017	41,50 ± 6,57	38	58	47,50 ± 8,40	38	66
September 2017	38,00 ± 7,64	38	62	43,00 ± 10,27	38	89
June 2018	40,00 ± 5,61	38	60	40,00 ± 7,58	38	71
September 2018	38,00 ± 1,52	38	42	42,00 ± 7,16	38	68
Median of 4 measurements	39,00 ± 6,63	38,00	59,00	42,50 ± 7,99	38,00	69,50

Note: SD = standard deviation, Min = minimum value, Max = maximum value

Table 4 shows the median values converted to % for all measurements. We see that the behavior of children in SO differs from the norm (from 100 %) by 3 %. The behavior of non-sporting children differs from the norm by 13 %. Non-sporty children have worse social behavior by 10 % compared to sporty children in SO.

Table 4. Comparison of behavioral scores converted to % for children in SO and non-sporty children

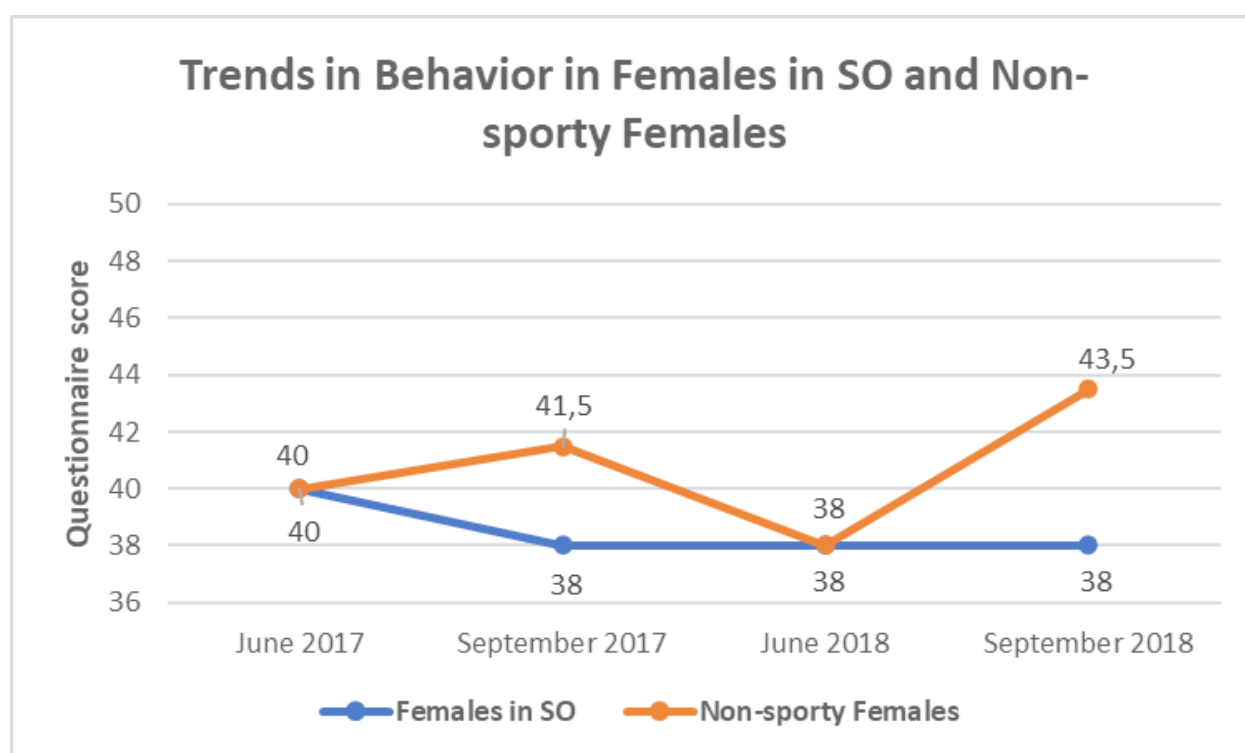
Median v % normy	Behavior in % norm		
	Children in SO	Non-sporty	Difference in non-sporty
June 2017	109 %	125 %	16 %
September 2017	100 %	114 %	14 %
June 2018	105 %	105 %	0 %
September 2018	100 %	111 %	11 %
Median of 4 measurements	103 %	113 %	10 %

Females participating in SO and non-sporty females

When comparing the development of trends in females' behavior (Figure 2), we see that sporty females have better behavior than non-sporty females. Only in June 2017 and 2018 was the behavior of both groups the same (40 points).

For **sporty females** (participants in SO), we see a **negative asymptomatic trend** with the highest value (worst behavior) of 40 points in June 2017, followed by stabilization at 38 which represents ideal social behavior with no problems at all. **Summer vacations have no effect on the behavior** of sporty females.

In **non-sporty females**, we see an **unbalanced trend** which has a different value in each measurement. The value is always lower in June (40 and 38 points) and the value is always higher in September (41,5 and 43,5 points). **During the school year, their behavior improves slightly, and conversely, during the summer vacations, the social behavior deteriorates.** This change is not statistically significant, see Table 2.

**Figure 2.** Graph of behavioral trends in sporty and non-sporty females

In the table (Table 5) we see descriptive statistics for gross scores in the behavioral questionnaire for sporty and non-sporty females. Also the maximum values in the questionnaire, i.e. the worst recorded behavior in non-sporty females, occurs in 3 of 4 measurements (June 2017, June 2018 and September 2018).

Table 5. Gross scores in the behavioral questionnaires for sporty and non-sporty females

Females – gross score	Females in SO			Non-sporty Females		
	Median \pm SD	Min	Max	Median \pm SD	Min	Max
June 2017	40,00 \pm 8,48	38	58	40,00 \pm 8,84	38	71
September 2017	38,00 \pm 9,06	38	62	41,50 \pm 5,44	38	59
June 2018	38,00 \pm 4,85	38	51	38,00 \pm 6,96	38	61
September 2018	38,00 \pm 0,89	38	40	43,50 \pm 7,75	38	64
Median of 4 measurements	38,00 \pm 6,67	38	54,5	40,75 \pm 7,36	38	62,5

Note: SD = standard deviation, Min = minimum value, Max = maximum value

Social behavior (Table 6) of sporty females does not differ from the norm (100 %) and for non-sporty females it differs from the norm by 7 %. **Non-sporty females have worse social behavior by 7 % compared to females who do sports.**

Table 6. Comparison of behavioral scores converted to % for females

Median score by gender in % of norm	Females in % norm		
	Females in SO	Non-sporty	Difference in non-sporty
June 2017	105 %	105 %	0 %
September 2017	100 %	109 %	9 %
June 2018	100 %	100 %	0 %
September 2018	100 %	115 %	15 %
Median of 4 measurements	100 %	107 %	7 %

Males participating in SO and non-sporty males

When comparing behavioral trends in males, we see (Figure 3) that non-sporty males have a higher value in the behavior questionnaire, it means worse social behavior throughout the measurement period.

Non-sporty males have a convex trend, where in each measurement they have a different value of points in the questionnaire and the summer vacations have no effect on their behavior.

Sporty males (participants in SO) have an unbalanced trend: they always have a lower value of points in September, i.e. better social behavior (38 and 39 points), and conversely, their behavior always worsens in June (values of 42 and 41 points). The summer vacations cause improvement in the social behavior and their behavior deteriorates during the school year. This change is not statistically significant, see Table 2.

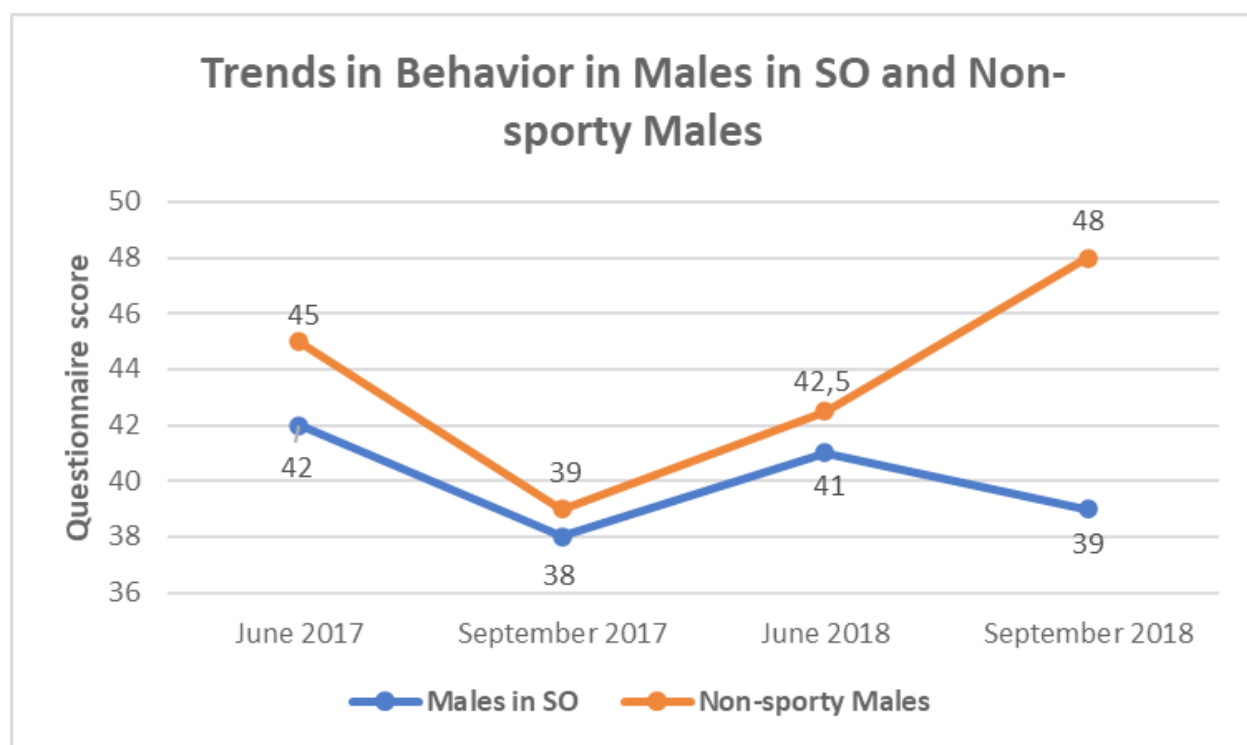


Figure 3. Graph of behavioral trends in sporty and non-sporty males

In the table (Table 7) we see descriptive statistics for the gross scores in the behavioral questionnaire for sporty and non-sporty males. The maximum values in the questionnaire or the worst manifestations of social behavior are higher throughout the research in non-sporty males (values 70, 62, 68 and 66 points).

Table 7. Gross scores in the behavioral questionnaires for sporty and non-sporty males

Males – gross score	Males in SO			Non-sporty Females		
	Median ± SD	Min	Max	Median ± SD	Min	Max
June 2017	42,00 ± 2,16	38	44	45,00 ± 8,07	38	70
September 2017	38,00 ± 6,96	38	61	39,00 ± 6,60	38	62
June 2018	41,00 ± 6,20	38	60	42,50 ± 8,11	38	68
September 2018	39,00 ± 1,77	38	42	48,00 ± 8,97	38	66
Median of 4 measurements	40,00 ± 6,58	38	52	43,75 ± 8,09	38	67

Note: SD = standard deviation, Min = minimum value, Max = maximum value

The social behavior of sporty males (Table 8) differs from the norm by 6 %, and that of non-sporty males differs from the norm by 15 %. **Non-sporty males have worse behavior by 9 % compared to males in SO.**

Table 8. Comparison of behavioral scores converted to % for males

Median score by gender in % of norm	Males in % norm		
	Males in SO	Non-sporty	Difference in non-sporty
June 2017	111 %	118 %	7 %
September 2017	100 %	103 %	3 %
June 2018	108 %	112 %	4 %
September 2018	103 %	126 %	23 %
Median of 4 measurements	106 %	115 %	9 %

DISCUSSION

The fact that all children in SO (males and females) have better social behavior than non-sporty children is likely to be due to the positive effects of physical activity and sport. A positive relationship between physical activity, improved behavior, reduced emotional problems, mental health and psychosocial well-being has already been demonstrated in children and adolescents with ID (Borland et al., 2022). Sport and physical activity lead to both the improvement of the physiological side of the individual, i.e. to increase muscle mass, strengthen bones, lower cholesterol, decrease heart rate, improve muscle coordination, and to improve the mental side of the individual, i.e. to increase self-confidence, stress compensation (Jančík, Závodná & Novotná, 2006), perception, attention, memory, thinking, speech development (Kvapilík & Černá, 1990, p. 91) and improve mood. Probably the main influence of sport is on fair play, discipline, and compliance with the rules. I think that sporty children are used to listening to a much greater extent (e.g. to a coach during training), and thus they have better behavior in all areas of their lives, including school.

Research on healthy adolescents has shown that adolescent athletes who participate in athletic disciplines and swimming also perform better at school than non-athletic classmates (Rees & Sabia, 2010). This is a suggestion for further future research on children with ID - to add another aspect of school success to social behavior and sport.

Furthermore, it is interesting that problem behaviors in children with ID abroad are 22 % - 64 % worse than the norm (Gillberg et al., 1986; Merrel & Holland, 1997; Totsika et al., 2011), while in the Czech Republic both sporty children (3 %) and non - sporty children (13 %) have a much lower incidence of problem behavior. The explanation may be that in the Czech Republic, compared to foreign research (where children with ID have 50% physical activity compared to the norm), children with ID have sufficient physical activity, i.e. reach 74 % - 122 % of the norm (the norm is 12 000 steps per day), (Kampasová & Válková, 2021), and thus even those children who do not participate in SO competitions probably have enough physical activity in their normal regime.

The fact that females have better social behavior than males could be explained by women having better relationships with others: they are more team-oriented and solve problems better (KarieraWeb, 2012). Men have higher testosterone levels, which makes them more prone to aggression (Psychology, 2014).

In the Czech Republic is a well-established education system for children with ID, where professional (graduated) teachers take care of the children. The school itself also provides a lot of voluntary activities for its children, such as outdoor school, swimming training, tourist course, floorball tournament, etc. Part of the regular teaching is, for example, structured learning, elements of art therapy, music therapy, speech therapy, self-sufficiency training in a training apartment, etc.

There was an unbalanced trend in children in SO, which causes a slight deterioration in their behavior during the school year, and, conversely, a slight improvement in behavior during the summer vacations. The composition of the children may play a role, with 40 % of children being of school age, 40 % of children being in pubescence and only 20 % of children being in adolescence. It is possible that prepuberty and puberty play a major role in their behavior at school. During this period, emotional instability increases, first loves arise, and mood swings are frequent (Nakonečný, 2011, pp. 679-680). Children may, for example, perform in front of each other in the school year, want to be the center of attention, etc. Children with ID develop a disparity between mental and biological maturity during puberty, which deepens during their further development, while in children without ID it equalizes (Lečbych, 2008, pp. 43-44).

CONCLUSIONS

Children in SO (females and males together) have an unbalanced trend in social behavior, and summer vacations cause an improvement in their behavior. Non-sporty children (females and males together) have a convex trend in social behavior and summer vacations have no effect on their behavior. Children in SO have better social behavior by 10 % compared to non-sporty children.

Females participating in SO have a negative asymptomatic trend in social behavior and summer vacations have no effect on their behavior. In non-sporty females, there is an unbalanced trend in social behavior, and summer vacations cause a deterioration in their behavior (and vice versa, there is an improvement in behavior during the school year). Females participating in SO have better social behavior by 7 % compared to non-sporty females.

Males participating in SO have an unbalanced trend in social behavior, and summer vacations cause an improvement in their social behavior (and vice versa, there is a deterioration in their behavior during the school year). There is a convex trend in social behavior for non-sporty males, and summer vacations have no effect on their behavior. Males participating in SO have better social behavior by 9 % compared to non-sporty males.

The behavior of children with ID in the Czech Republic is very good, as they differ very little from the norm of ideal social behavior. The results showed that sport in children with ID leads to fair play, to improve their social behavior, and therefore sport should be supported nationwide for children with ID.

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