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Studia paedagogica. 2024, vol. 29, iss. 3, pp. [80]-105

ISSN 2336-4521 (online)

Stable URL (DOI): <https://doi.org/10.5817/SP2024-3-4>

Stable URL (handle): <https://hdl.handle.net/11222.digilib/digilib.81364>

Access Date: 13. 02. 2025

Version: 20250212

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STUDY

ANALYZING STUDENT PERFORMANCE IN CONNECTION WITH LEARNING DISORDERS AND EXTRACURRICULAR ACTIVITIES IN FOREIGN LANGUAGE CLASSES

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ABSTRACT

In our study, we investigate the academic performances of students with atypical developmental pathways (dyslexia, dysgraphia, and dyscalculia) as compared to students without these disorders. Specifically, we consider how their performance is influenced by participation in classes with varying curricula and by their family background. To do this, we analyze data from the Hungarian National Competency Measurement 2019, tenth grade (83,751 students), of whom 1,515 students had one or more learning disorders (dyslexia, dysgraphia, dyscalculia). The students were enrolled in the standard curriculum, in intensive foreign language learning experiences, or in an increased number of lessons. We conducted a secondary analysis of the SPSS by creating two- and three-dimensional ANOVA tables and cross-tabulation analysis. Family background is examined using a central complex variable created from several variables by the Hungarian Education Office. Our results show that learning disabled students enrolled in a foreign language class have higher competence performance scores in both reading comprehension and mathematics than learning disabled students enrolled in a standard curriculum class, but lower than those enrolled in a class with an increased number of lessons; the same pattern is seen in participation in extracurricular activities. It seems that higher-achieving students enroll in advanced level foreign language training, but participants in advanced level training in other subjects are able to achieve even higher results, which may be due to family background. Different learning disorders affect student performance, but overall, the order set up based on student performance in classes with different curricula is the same for students with typical and atypical development.

KEYWORDS

specific learning disorder; student performance; family background; extracurricular activities; secondary school; National Competency Measurement; Hungary

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Introduction

There is a wide body of literature on student performance, but it has tended to focus on the performance of students with typical development; little research has been conducted on students with atypical development (LeRoy et al., 2019). Atypical development includes several subcategories. In the present study, we focus on students with dyslexia, dysgraphia, dyscalculia, or a combination of these specific learning disorders. In Hungary, these students constitute almost half of the special educational needs category, and they participate in integrated, inclusive education alongside their peers with typical development (Hegedűs, 2023). We chose these groups for the study because they have a problem with one aspect of their learning, and we wanted to see how this affects their academic performance. Students with and without learning disorders are in the same class and have to meet the same requirements, so the aim of our study is to compare their performances to see how well they are doing at the required level. To assess their performance, we use the results of the National Competency Measurement (NCM), which includes their mathematics and reading comprehension results.

Learning a foreign language or a second language requires a different way of thinking than was used for learning the first language, and this can present a particular challenge for students with atypical development. Therefore, in our study, we are mainly interested in the outcomes of typical and atypical learners in classes with intensive foreign language learning. In order to interpret their results, we will also examine the results of students in standard curriculum classes and those in classes with an increased number of lessons in other subjects.

We look at which types of classes – with a standard curriculum or with an increased number of lessons – students do best in, and whether extra lessons and family background really have a positive impact on their performance. Examining family background is important both because it is an even stronger

determinant of student performance in Hungary than in other countries and because it also affects whether students can participate in school-only or extracurricular activities, the latter of which may be more likely to be paid activities (Hegedűs, 2020; Róbert, 2004). Research has suggested that participation in extracurricular activities could be important for people with learning disorders, for example, because the experiences and successes they have in such activities can have a positive impact on their academic performance, which is otherwise lower due to their learning disorder (Hegedűs, 2024).

There is a limited body of literature on the achievement of students with learning disorders. The description of the Hungarian situation and the factors influencing the learning outcomes of Hungarian students may be of interest internationally because what affects the performance of students with learning disorders in Hungary may also be present in other countries. Factors that have a positive impact in Hungary may also have an impact in other countries, thereby increasing the achievement of students in those countries. Furthermore, the study is significant because studies on whole populations are rarely done on such a large sample, so the results here can be considered well supported.

1 A brief introduction to specific learning disorders

A specific learning disorder can be considered a sub-disorder because students with these disorders show significant deficits in basic cultural techniques (writing, reading, counting), but no problems in other areas; they may even be highly gifted in some areas (Beckmann & Minnaert, 2018; Englbrecht & Weigert, 1996; Kirk & Bateman, 1962). The development of specific learning disorders is most often due to neurological or neuropsychological causes (e.g., neurodevelopmental dysfunction), hereditary factors, negative environmental influences, and external influences, but the specific cause is still unknown (Beckmann & Minnaert, 2018). The literature is not consistent on the relationship between intelligence level and specific learning disorders, with some researchers suggesting that these disorders develop at low IQ levels (75-85 IQ) (Englbrecht & Weigert, 1996); more recent literature has suggested that these disorders are more likely to develop above 90 IQ (Mesterházi & Szekeres, 2019; Şahin et al., 2020).

One specific learning disorder is dyslexia (reading disorder); dyslexia may develop even during growth in the womb, as a result of adverse and/or neurobiological abnormalities, but it does not affect the full spectrum of intelligence (Gyarmathy, 1998, 2018). Acquired dyslexia usually occurs later in life due to various brain trauma, head injury, stroke, infection, or cancer (Chase & Tallal, 1992; Gyarmathy, 2018). Dyslexia can have a number of symptoms, such as impaired reading sub-tasks (word recognition, oral reading

skills) or reading comprehension (BNO, 2004). The neurological abnormality in dyslexia is unquestionable, and it is likely to be a problem in the connectivity system in the brain network (Csépe, 2008; Žabkar et al., 2023). Dyslexia is often associated with spelling disorders and, as secondary symptoms, behavioral and emotional disorders (Cristofani et al., 2023).

Dysgraphia is also a specific learning disorder, a disorder of writing execution, namely a problem with the technical ability to write; dysgraphia can present symptoms that vary depending on gender and age (Biotteau et al., 2019). We also distinguish dysorthography, which is a disorder in the application of spelling rules (Dékány & Mohai, 2012). According to Gerebenné Várbíró (1995), dysgraphia is of neurological origin and can be caused by an underdevelopment of movement, spatial and temporal orientation, vision, hearing, speech hearing, and the visual system. Symptoms of dysgraphia may include slower writing speed, difficulty in recalling the shape of letters, poor verbal memory, errors in marking duration, using capital letters, spaces and punctuation, fine motor and graphomotor errors, incorrect spelling, and problems with line spacing (Chordia et al., 2020; Chung et al., 2020; Meixner, 2015). Dysgraphia is often associated with other specific learning disorders such as dyslexia (Chung et al., 2020).

Specific learning disorders include dyscalculia, a disorder of arithmetic skills that may appear during development or later as a result of brain injury (Márkus, 2007). The literature is not consistent on what underlies dyscalculia: damage to neuropsychological structures and functions (Farkasné Gönczi, 2011; Jiménez-Fernández, 2016), which does not affect general intelligence, or damage to mathematical solution systems, such as spatial-visual impairment (Rourke, 1993). Dyscalculia is a disorder of basic skills such as addition, subtraction, multiplication, and division; it has less effect on those skills based on abstraction (algebra, geometry, trigonometry) (BNO, 2004; Jiménez-Fernández, 2016). Dyscalculia is not only a disorder in number and mathematical processing, comprehension, and memorization; it includes other disorders in other areas of mathematics, such as visual, spatial, and verbal problems (Menon et al., 2020; Witzel & Mize, 2018). Dyscalculia often co-occurs with dyslexia, but co-occurrence has rarely been studied (Joyner & Wagner, 2020).

2 Some characteristics of student performance gaps and extracurricular activities

Student performance is influenced by a number of factors, such as family background, personal characteristics, motivation, active involvement in lessons, social and territorial environment, and teacher characteristics. The family background plays an important role in many aspects of the child's

development – for example, children from families with a better social background have better health and may be less likely to be born prematurely, which is assumed to make them less likely to develop learning disorders later in life (Parasuraman et al., 2018). Family background also plays an important role in the extent to which parents, siblings, and those in the child’s immediate environment can accept the child’s difficulties, create a motivating environment for the child, and set an example for the child, for example in communication or schooling (Bernstein, 2003; Hegedűs, 2020; Mesterházi, 2008). Furthermore, it is important to know what kind of school parents send their children to, how involved they are in their children’s studies and school life, and whether they can afford to participate in various extracurricular activities (Hegedűs, 2020; Pusztai, 2009; Sebestyén, 2023; Šedřová & Sedláček, 2023; Ule & Živoder, 2023).

According to a previous study, children with learning disorders in Hungary have poorer family backgrounds (Hegedűs, 2021), which is a problem because the literature shows that children with better family backgrounds tend to attend higher quality educational institutions or even choose special “training types”¹ that their parents consider more challenging than the standard curriculum, so overall there is selection in the education system that may be reinforced by institutional admission procedures (Garami, 2020; Hegedűs, 2016, 2020). Significant differences can be seen between students with learning disorders and students with typical development in different training types in general, as well as when comparing the performance of different training types. The lowest performers are students in the standard curriculum and the best performers are students in the training type with extra hours, which includes an increased number of lessons in a subject (Hegedűs & Sebestyén, 2023). Children from better family backgrounds are financially less likely to travel long distances and can finance more extracurricular activities; this can have an overall positive impact on their academic performance (Hegedűs, 2020; Sebestyén, 2023).

Student performance is affected by the type of learning disorder (Hegedűs, 2021), and it is necessary to consider not only – for example – the negative impact of a reading disorder on reading comprehension performance, but also about other areas that may be affected. According to Hegedűs and Sebestyén (2019) reading comprehension, mathematics, and foreign language performance are closely correlated. Depending on the nature of the special

¹ The Act CXC of 2011 on National Public Education gives students the opportunity to study certain subjects for a higher number of lessons. These are known as modular training types or training types with extra hours (Act CXC of 2011).

educational need, children may be co-educated with their mainstream peers, which also affects their academic performance, along with the number of children per special needs teacher in their compulsory development even with co-education (Hegedűs, 2023).

If an individual has a difficulty, such as a learning disorder, it may often be associated with other disorders, such as behavioral problems (Benz & Powell, 2020). This can have a negative impact on the individual's motivation and performance, which may lead to lower goals for future plans (Hegedűs & Sebestyén, 2023; Lohmann, 1998). It is necessary to motivate learners; people with learning disorders may be gifted in other areas, but this is often difficult to see because, according to experts on the relationship between learning disorders and giftedness, there is a potential for masking – children with specific learning disorders may compensate for the emergence of their learning disorder by using their giftedness (Flanagan et al., 2013; Romano et al., 2024; Stankovska & Rusi, 2014).

For children with special educational needs, it is perhaps even more important to address their talents in order to balance their learning difficulties and help them to experience success in other areas (Westendorp et al., 2011). In many cases, giftedness can be addressed through extracurricular activities in or out of school, including support for children from parents and teachers (Beckmann & Minnaert, 2018). The financial situation of the family influences the extracurricular activities that children can attend – from activities organized at school, which are usually free, to private lessons that parents have to pay for (Rolff et al., 2008; Sebestyén, 2023). Research by Szemerszki (2020) showed that children from better family backgrounds are more likely to attend extra lessons in mathematics for catching up and in foreign languages for acquiring additional skills. More educated mothers are more supportive of their children's participation in sports (Şahin, 2018), but this should be important for all, as physical sports activities can contribute to better academic performance (Adeyemo, 2010; Shulruf et al., 2008).

3 Research questions and hypotheses

Based on the literature, we formulated the following research questions for our study:

- What are the differences in reading comprehension and mathematics competence performance scores between students with learning disorders at classes with different curriculum?
- What are the differences between the in-school and extracurricular activities of students with learning disorders at classes with different curriculum?

- What is the relationship between family background index, learning disorder, and classes with different curriculum in performance and participation in-school and extracurricular activities?

In relation to the research questions, the following three hypotheses were formulated:

- Students with learning disorders in the classes with standard curriculum have the lowest mathematics and reading comprehension scores; students without learning disorders in classes with increased numbers of lessons have the highest scores.
- Students without learning disorders participate more in in-school and extracurricular activities in all analyzed class types.
- Family background influences student performance and participation in in-school and extracurricular activities.

4 Database and methods

For this research, we analyze the data from the National Competency Measurement (NCM) 2019, tenth grade,² because this is the last database that was recorded before COVID, and the results of the students are not affected by the changed (educational) opportunities during the pandemic. The National Competency Measurement is also called the “little sister of PISA” in Hungary because it measures competence performance in mathematics and reading comprehension. PISA and NCM scores are not comparable because they use a different scoring system. Student competences in mathematics and reading comprehension have been measured using NCM with the participation of all sixth, eighth, and tenth grade students since 2002. A set of centralized tests is prepared for students to complete in their schools on a date in May and under conditions set by the Educational Authority. Background questionnaires are also produced for the competence tests, which include questions about students at the student, site, and institutional level (Oktatási Hivatal, 2024). Our study presents a secondary analysis carried out on the NCM database.

The database contains information on a total of 83,751 students from tenth grade, of whom 1,515 have a learning disorder (dyslexia, dysgraphia, dyscalculia). Learning disorders are diagnosed by special education teachers, psychologists and, if necessary, doctors at educational services. No diagnosis is made during the competence measurement; the students assigned to the examined categories received their diagnosis in advance, and this must be

² It is the second year of the ISCED 3.

indicated in the background questionnaires of the competence measurement. The Committee of Educational Experts follows the criteria of the International Statistical Classification of Diseases and Related Health Problems (ICD) for the diagnosis of learning disorders. The different types of learning disorders can thus be interpreted internationally.

Each of the eight types of learning disorders was queried separately in a background questionnaire during the data collection process, so that we were able to identify the 1,515 students with dyslexia, dysgraphia, and/or dyscalculia along these variables. Some students have two or all three of the learning disorders we included in the study, so we took care in the coding to ensure that the learning disorder variables were not simply a combination of the dyslexia, dysgraphia, and dyscalculia groups; students with more than one disorder were also included in the study group. It is possible that a student may have an additional learning disorder type, but this was not investigated because these three types of learning disorders under consideration are the dominant ones, according to the newer classification systems. For the remainder of this article, for the sake of simplicity, the term “learning disorder” is used to refer only to those with dyslexia, dysgraphia, dyscalculia, or some combination of the three, and “learning disorder non-disabled” to refer to those students who do not have dyslexia, dysgraphia, or dyscalculia.

By classes, we can distinguish between students in classes with standard curriculum (37,888), students with a proven language background (11,011) and students in intensive classes (12,332). The NCM database classifies students as standard, bilingual, intensive, and minority language learned. The bilingual and minority types were combined into classes with intensive foreign language learning (intensive FLL), to which we also added students from the standard and the upper-secondary groups who had attended language preparation after eighth grade.³ The creators of the NCM database classified the students studying in some intensive class into the group with an increased number of hours, but did not indicate which subject they studied for an increased number of hours. Therefore, this group also included students participating in a language course (i.e., students with an increased number of foreign language classes), but the limitation of our research is that we could not separate them

³ In the Hungarian education system, primary education can last four, six, or eight years. In the first two cases, students can continue their studies in an eight- or six-year grammar school; after eight years of primary education, they can enrol in a four-year grammar school or a three- or four-year vocational school. Secondary school and, in some cases, technical and vocational education and training may be extended by a so-called “zero year” of advanced foreign language learning for bilingual or preparatory language training. This is followed by a second year of secondary school curriculum (Act CXC of 2011; Act LXXX of 2019; Eurydice, 2024).

from those attending other classes. Another limitation of the research is that the background questionnaires for the competence measurement do not record the number of increased lessons. Usually this means two extra lessons, but students have 17 lessons in the language year of dual language courses (Oktatási Hivatal, 2020). For the rest of the standard curriculum and the increased timetable group, we kept the original NCM classification.

To examine family background, we use the central Family Background Index (FBI), a multivariate index created by the Hungarian Educational Authority, which includes parents' educational attainment and workplace. The family background index is composed of the educational attainment of the father and mother, the number of computer(s) in the household, the number of books in the home, and the number of books owned by the student. Higher values indicate higher family background (Hegedűs, 2020). In all the questions where students were asked whether they had participated in development, talent management, etc., yes and no answers were possible; students who did not complete this question were excluded from the assessment.

Secondary analysis of the data is performed using SPSS, two- and three-dimensional ANOVA analysis, and two- and three-dimensional cross-tabulation analysis using a Chi-square test and row percentage. In the family background index, it was possible to use the variables combined in the index as one variable during the ANOVA analysis, rather than binary coded in the regression analysis. In the analysis, asterisks are used to indicate significant relationships, and the number of asterisks indicates the strength of significance ($***p \leq 0.001$, $**0.001 < p \leq 0.010$, $*0.010 < p \leq 0.050$). A limitation of our research is that not all students have all their data filled in, so there may be differences in the number of students during the analyses presented in the study.

5 Results

5.1 Student performance according to learning disorder and class types

Significant connections were found according to learning disorder and training type between mathematics, reading comprehension, and family background index. The lowest scores were found in the standard curriculum classes, followed by those classes with intensive FLL; while the highest scores were found in those classes with an increased number of lessons, regardless of whether the student had a learning disorder or not. In all grades, the results of students with learning disorders were significantly lower than those of students without learning disorders.

We also found a difference in the family background index, because students with learning disorders had a poorer background in the classes with an increased number of lessons, as well as in the classes with intensive FLL.

In contrast, the family background of students with learning disorders was minimally better in the classes with an increased number of lessons. The selection by family background could also be identified by the different choices of training types (Table 1).

Table 1

Correlations between NCM scores and family background index of students with and without learning disorders by training types

Training type	Learning disorder		Mathematics***	Reading***	Family background index***
with standard curriculum	no	<i>M</i>	1619.0	1607.0	-0.208
		<i>SD</i>	194.3	195.7	0.937
	yes	<i>M</i>	1504.7	1468.9	-0.257
		<i>SD</i>	178.6	175.9	0.821
	total	<i>M</i>	1616.2	1603.6	-0.209
		<i>SD</i>	194.7	196.4	0.934
intensive FLL	no	<i>M</i>	1718.3	1717.9	0.303
		<i>SD</i>	178.9	183.9	0.865
	yes	<i>M</i>	1561.2	1526.1	0.100
		<i>SD</i>	194.0	196.9	0.825
	total	<i>M</i>	1716.9	1716.2	0.301
		<i>SD</i>	179.6	184.9	0.865
with an increased number of lessons	no	<i>M</i>	1781.6	1778.5	0.524
		<i>SD</i>	157.8	148.0	0.743
	yes	<i>M</i>	1636.4	1623.7	0.534
		<i>SD</i>	209.2	182.6	0.727
	total	<i>M</i>	1780.6	1777.4	0.524
		<i>SD</i>	158.7	148.9	0.743
total	no	<i>M</i>	1670.2	1662.1	0.035
		<i>SD</i>	196.6	198.4	0.941
	yes	<i>M</i>	1520.3	1486.4	-0.160
		<i>SD</i>	186.3	183.5	0.846
	total	<i>M</i>	1667.5	1658.9	0.032
		<i>SD</i>	197.4	199.5	0.940
N			60,534	60,572	56,640

Note: *** $p \leq 0.001$

Source: NCM (2019)

5.2 In-school and extracurricular activities of students with and without learning disorders in different classes

In examining the activities within the institution, we conducted a multi-dimensional cross-tabulation analysis with a row percentage. The database

did not allow us to examine whether students with learning disorders participate in the educationally required habilitation and rehabilitation activities, but Table 2 shows that students without learning disorders might also participate in similar remedial activities. Participation in remediation and development activities showed an inverted pattern for students with and without learning disorders. Of the students without a learning disorder, 18.5% of those in the standard curriculum participated in such activities, 17.2% of those from classes with intensive FLL, and 16.1% of those from classes with an increased number of lessons; for students with a learning disorder, 60.3% were in the standard curriculum, 69.0% in the intensive FLL, and 76.5% in the classes with an increased number of lessons.

Table 2

Participation of students with and without learning disorders in tutoring and developmental activities by training types

Training type	Learning disorder		Participation in tutoring, developmental activities		Total
			yes	no	
with standard curriculum***	no	N	6,301	27,720	34,021
		row%	18.5%	81.5%	100.0%
	yes	N	511	337	848
		row%	60.3%	39.7%	100.0%
	total	N	6,812	28,057	34,869
		row%	19.5%	80.5%	100.0%
intensive FLL***	no	N	1,714	8,255	9,969
		row%	17.2%	82.8%	100.0%
	yes	N	60	27	87
		row%	69.0%	31.0%	100.0%
	total	N	1,774	8,282	10,056
		row%	17.6%	82.4%	100.0%
with an increased number of lessons***	no	N	1,811	9,457	11,268
		row%	16.1%	83.9%	100.0%
	yes	N	65	20	85
		row%	76.5%	23.5%	100.0%
	total	N	1,876	9,477	11,353
		row%	16.5%	83.5%	100.0%
total	no	N	9,826	45,432	55,258
		row%	17.8%	82.2%	100.0%
	yes	N	636	384	1,020
		row%	62.4%	37.6%	100.0%
	total	N	10,462	45,816	56,278
		row%	18.6%	81.4%	100.0%

Note: *** $p \leq 0.001$

Source: NCM (2019)

Half as many students attended talent development education as attended tutoring or catch-up courses. There was a significant difference ($p = 0.033$) between the two groups in the classes with standard curriculum, in which the proportion of students with learning disorders attending talent development education was the lowest of all groups (5.5%). Another significant difference ($p = 0.001$) was found for the whole sample of the database in favor of those without a learning disorder. A higher proportion of students participated in talent development education than in the intensive FLL, where the participation rate of students with learning disorders (11.4%) was higher than that of students without learning disorders (10.6%). The highest participation rate in talent development education was found in the classes with an increased number of lessons, with 15.6% of students with learning disorders participating in talent development education compared to 16.9% of students without learning disorders. They also showed that different classes offer different opportunities for students (Table 3). We also ran a similar analysis of the sports opportunities provided by the institution, but in neither case did the results show a significant difference.

Table 3

Participation of students with and without learning disorders in gifted education by training type

Training type	Learning disorder		Participation in a talent development education		Total
			yes	no	
with standard curriculum*	no	N	2,437	30,944	33,381
		row%	7.3%	92.7%	100.0%
	yes	N	43	738	781
		row%	5.5%	94.5%	100.0%
	total	N	2,480	31,682	34,162
		row%	7.3%	92.7%	100.0%
intensive FLL	no	N	1,041	8,787	9,828
		row%	10.6%	89.4%	100.0%
	yes	N	9	70	79
		row%	11.4%	88.6%	100.0%
	total	N	1,050	8,857	9,907
		row%	10.6%	89.4%	100.0%
with an increased number of lessons	no	N	1,898	9,315	11,213
		row%	16.9%	83.1%	100.0%
	yes	N	12	65	77
		row%	15.6%	84.4%	100.0%
	total	N	1,910	9,380	11,290
		row%	16.9%	83.1%	100.0%
total**	no	N	5,376	49,046	54,422
		row%	9.9%	90.1%	100.0%
	yes	N	64	873	937
		row%	6.8%	93.2%	100.0%
	total	N	5,440	49,919	55,359
		row%	9.8%	90.2%	100.0%

Note: **0.001 < p ≤ 0.010, *0.010 < p ≤ 0.050

Source: NCM (2019)

The following was a description of activities outside the institution. There was a significant difference ($p = 0.004$) between the two groups in the participation in extra math lessons at the classes with an increased number of lessons. At this level, 23.2% of students without learning disorders participated in math lessons compared to 36.3% of students with learning disorders. There was also a difference between the training types, with the lowest participation in math lessons in the standard curriculum (16.4% and 14.8%) and higher in the intensive FLL (18.5% and 17.6%). In comparison, participation was much higher in the classes with an increased number of lessons (Table 4). It should be noted that the background questionnaire of the competence measurement does not cover Hungarian language lessons, so we were not able to investigate participation in these classes.

Table 4

Participation of students with and without learning disorders in special mathematics lessons by training types

Training type	Learning Disorder		Participation in a special mathematics lesson		Total
			yes	no	
with standard curriculum	no	<i>N</i>	5,589	28,574	34,163
		row%	16.4%	83.6%	100.0%
	yes	<i>N</i>	123	710	833
		row%	14.8%	85.2%	100.0%
	total	<i>N</i>	5,712	29,284	34,996
		row%	16.3%	83.7%	100.0%
intensive FLL	no	<i>N</i>	1873	8,225	10,098
		row%	18.5%	81.5%	100.0%
	yes	<i>N</i>	15	70	85
		row%	17.6%	82.4%	100.0%
	total	<i>N</i>	1,888	8,295	10,183
		row%	18.5%	81.5%	100.0%
with an increased number of lessons*	no	<i>N</i>	2,631	8,708	11,339
		row%	23.2%	76.8%	100.0%
	yes	<i>N</i>	29	51	80
		row%	36.3%	63.8%	100.0%
	total	<i>N</i>	2,660	8,759	11,419
		row%	23.3%	76.7%	100.0%
total	no	<i>N</i>	10,093	45,507	55,600
		row%	18.2%	81.8%	100.0%
	yes	<i>N</i>	167	831	998
		row%	16.7%	83.3%	100.0%
	total	<i>N</i>	10,260	46,338	56,598
		row%	18.1%	81.9%	100.0%

Note: $*0.010 < p \leq 0.050$

Source: NCM (2019)

There were two significant differences in participation in extracurricular foreign language classes. In the standard curriculum ($p = 0.027$), 14.9% of students without learning disorders attended such extracurricular classes outside the institution, compared to 12.5% of students with learning disorders. The other significant result ($p = 0.000$) was in the full dataset, where 20.1% of students without learning disorders attended extracurricular classes in extracurricular foreign languages, compared to 15.1% of students with learning disorders. There was no significant difference between the two groups for those classes with intensive FLL, but a much higher proportion of students attended special foreign language classes (21.9% and 19.8%), with the highest rates for students in classes with an increased number of lessons, where more than a third of

students (34.1% and 37.5%) attended extracurricular foreign language classes. In the latter case, a higher proportion of students with learning disorders attended an extracurricular foreign language class, which was not the case in other training types. The higher proportions in the classes with an increased number of lessons might be explained not only by the better family background of the students (see Table 1), but also by the unknown proportion of students from classes with an increased number of foreign language lessons (Table 5).

Table 5

Participation of students with and without learning disorders in extracurricular foreign language lessons by training types

Training type	Learning disorder		Participation in extracurricular foreign language lessons		Total
			yes	no	
with standard curriculum*	no	N	5,067	28,862	33,929
		row%	14.9%	85.1%	100.0%
	yes	N	102	717	819
		row%	12.5%	87.5%	100.0%
	total	N	5,169	29,579	34,748
		row%	14.9%	85.1%	100.0%
intensive FLL	no	N	2,185	7,808	9,993
		row%	21.9%	78.1%	100.0%
	yes	N	16	65	81
		row%	19.8%	80.2%	100.0%
	total	N	2,201	7,873	10,074
		row%	21.8%	78.2%	100.0%
with an increased number of lessons	no	N	3,876	7,489	11,365
		row%	34.1%	65.9%	100.0%
	yes	N	30	50	80
		row%	37.5%	62.5%	100.0%
	total	N	3,906	7,539	11,445
		row%	34.1%	65.9%	100.0%
total*	no	N	11,128	44,159	55,287
		row%	20.1%	79.9%	100.0%
	yes	N	148	832	980
		row%	15.1%	84.9%	100.0%
	total	N	11,276	44,991	56,267
		row%	20.0%	80.0%	100.0%

Note: $*0.010 < p \leq 0.050$

Source: NCM (2019)

Extra sports lessons could also have a beneficial effect on student performance, so we included this in the study. In the full dataset, there was a significant difference ($p = 0.000$) between the two groups of students, with a higher proportion of students without learning disorders (28.6%) attending extra sport lessons than students with learning disorders (23.7%). At the classes with standard curriculum, close to the borderline of significance ($p = 0.053$), we saw that students without learning disorders have a higher proportion of participation in extra sports lessons (23.7% and 21.2%). The proportion of students with intensive FLL who participated in extra sports classes is much higher compared to the standard curriculum classes (34.9% and 34.1%); the proportion was even higher in classes with an increased number of lessons (37.9% and 38.3%) (Table 6).

Table 6

Participation of students with and without learning disorders in extra sports lessons by training types

Training type	Learning disorder		Participation in extra sports lessons		Total
			yes	no	
with standard curriculum	no	N	8,025	25,885	33,910
		row%	23.7%	76.3%	100.0%
	yes	N	173	644	817
		row%	21.2%	78.8%	100.0%
	total	N	8,198	26,529	34,727
		row%	23.6%	76.4%	100.0%
intensive FLL	no	N	3,464	6,457	9,921
		row%	34.9%	65.1%	100.0%
	yes	N	28	54	82
		row%	34.1%	65.9%	100.0%
	total	N	3,492	6,511	10,003
		row%	34.9%	65.1%	100.0%
with an increased number of lessons	no	N	4,256	6,960	11,216
		row%	37.9%	62.1%	100.0%
	yes	N	31	50	81
		row%	38.3%	61.7%	100.0%
	total	N	4,287	7,010	11,297
		row%	37.9%	62.1%	100.0%
total***	no	N	15,745	39,302	55,047
		row%	28.6%	71.4%	100.0%
	yes	N	232	748	980
		row%	23.7%	76.3%	100.0%
	total	N	15,977	40,050	56,027
		row%	28.5%	71.5%	100.0%

*** $p \leq 0.001$

Source: NCM (2019)

As shown in Table 7, we examined the family background index of students who participated and did not participate in in-school activities as a function of training type and learning disorder, in order to obtain information on the role of family background in participation in extracurricular activities. We found a significant difference in all categories by ANOVA analysis ($p = 0.000$). In all three training types, students without learning disorders who did not participate in tutoring had a better family background index. Students with a learning disorder were more likely to participate in these activities if they had a better family background; the reverse was true for those with a learning disorder, but the values were very high and close together.

In terms of participation in talent development education, there was a clear trend in all three training types, in both groups of students, towards participation by students with a better family background, which suggests that family background played a decisive role. Our research showed that participation in school recreational sports activities per se did not show significant differences between the groups of students studied, but that differences could be found when family background was examined. There were small differences in the family background index for participation in school sports activities for students in the classes with standard curriculum, while in the intensive FLL and classes with an increased number of lessons there was a tendency for those with a higher family background to participate less in these activities (Table 7).

Table 7

Family backgrounds of students with and without learning disorders in different extracurricular school activities by training types

Training type	Learning disorder	Tutoring, development lessons	FBI***	Talent management lessons	FBI***	School recreational sports activities	FBI***
with standard curriculum	no	yes	-0.213	yes	0.378	yes	-0.201
		no	-0.205	no	-0.248	no	-0.207
		total	-0.207	total	-0.202	total	-0.206
	yes	yes	-0.176	yes	0.293	yes	-0.269
		no	-0.359	no	-0.270	no	-0.252
		total	-0.248	total	-0.240	total	-0.255
	total	yes	-0.210	yes	0.377	yes	-0.202
		no	-0.207	no	-0.248	no	-0.208
		total	-0.208	total	-0.203	total	-0.207
intensive FLL	no	yes	0.209	yes	0.443	yes	0.233
		no	0.331	no	0.295	no	0.328
		total	0.310	total	0.310	total	0.310
	yes	yes	0.137	yes	0.285	yes	-0.061
		no	-0.218	no	0.097	no	0.128
		total	0.034	total	0.113	total	0.092
	total	yes	0.207	yes	0.442	yes	0.231
		no	0.329	no	0.293	no	0.327
		total	0.307	total	0.309	total	0.308
with an increased number of lessons	no	yes	0.465	yes	0.754	yes	0.539
		no	0.538	no	0.483	no	0.520
		total	0.526	total	0.529	total	0.523
	yes	yes	0.525	yes	0.666	yes	0.336
		no	0.560	no	0.512	no	0.577
		total	0.533	total	0.536	total	0.545
	total	yes	0.467	yes	0.753	yes	0.538
		no	0.538	no	0.484	no	0.520
		total	0.526	total	0.529	total	0.523
total	no	yes	-0.012	yes	0.524	yes	0.035
		no	0.049	no	-0.010	no	0.040
		total	0.038	total	0.043	total	0.039
	yes	yes	-0.072	yes	0.372	yes	-0.208
		no	-0.299	no	-0.180	no	-0.146
		total	-0.156	total	-0.144	total	-0.156
	total	yes	-0.016	yes	0.523	yes	0.031
		no	0.046	no	-0.013	no	0.037
		total	0.035	total	0.040	total	0.036
N			52,564	N	51,741	N	51,616

*** $p \leq 0.001$

Source: NCM (2019)

5.3 Family background index according to learning disorder, class types, and participation in-school and extracurricular activities

In our final analysis, shown in Table 8, we examined extracurricular activities in the context of learning disorder, training type, and family background index. For participation in extra lessons in mathematics, the effect of family background was clearly visible, as students with a better family background were more likely to participate in extra lessons, which could also be explained by the fact that most of these lessons had to be paid for. There was one exception, in the category of students with learning disorders in classes with an increased number of lessons, where the family background index of students attending extra lessons was lower (0.517 and 0.530).

A similar trend could be observed in the case of extra tuition in a foreign language, where those with a better family background were more likely to attend this type of extra tuition. On the other hand, it could be seen that those from lower family backgrounds attended mathematics classes; those from better family backgrounds spent more on foreign language classes.

The extra sports classes were also attended by students from better family backgrounds, and the family background index increased in the direction of the classes with an increased number of lessons. In general, it was true for the participation in sport classes that the family background index was between the family background index in each category between the extra lessons in mathematics and foreign language, with exceptions such as students with learning disorders in the classes with standard curriculum or students without learning disorders in the classes with an increased number of lessons (Table 8).

Table 8

Family background of students with and without learning disorders in different extracurricular activities by training type

Training type	Learning disorder	Mathematics	FBI***	Foreign language	FBI***	Sport	FBI***
with standard curriculum	no	yes	0.074	yes	0.426	yes	0.226
		no	-0.260	no	-0.315	no	-0.339
		total	-0.205	total	-0.203	total	-0.204
	yes	yes	0.063	yes	0.207	yes	-0.024
		no	-0.328	no	-0.324	no	-0.318
		total	-0.269	total	-0.257	total	-0.257
	total	yes	0.074	yes	0.422	yes	0.221
		no	-0.262	no	-0.316	no	-0.338
		total	-0.207	total	-0.204	total	-0.205
intensive FLL	no	yes	0.392	yes	0.535	yes	0.582
		no	0.287	no	0.249	no	0.160
		total	0.307	total	0.312	total	0.308
	yes	yes	0.503	yes	0.311	yes	0.469
		no	0.052	no	0.080	no	0.081
		total	0.132	total	0.128	total	-0.119
	total	yes	0.393	yes	0.534	yes	0.581
		no	0.285	no	0.248	no	0.158
		total	0.305	total	0.311	total	0.307
with an increased number of lessons	no	yes	0.554	yes	0.671	yes	0.739
		no	0.516	no	0.448	no	0.392
		total	0.525	total	0.525	total	0.524
	yes	yes	0.517	yes	0.798	yes	0.665
		no	0.530	no	0.392	no	0.478
		total	0.525	total	0.538	total	0.551
	total	yes	0.554	yes	0.672	yes	0.738
		no	0.516	no	0.448	no	0.393
		total	0.525	total	0.525	total	0.524
total	no	yes	0.259	yes	0.533	yes	0.444
		no	-0.011	no	-0.084	no	-0.126
		total	0.039	total	0.042	total	0.038
	yes	yes	0.182	yes	0.339	yes	0.140
		no	-0.241	no	-0.247	no	-0.246
		total	-0.169	total	-0.157	total	-0.155
	total	yes	0.258	yes	0.530	yes	0.440
		no	-0.015	no	-0.087	no	-0.128
		total	0.035	total	0.038	total	0.035
N			52,838	N	52,563	N	52,320

*** $p \leq 0.001$

Source: NCM (2019)

6 Discussion

In testing our hypotheses, we found that our first hypothesis – students with learning disorders in the classes with standard curriculum have the lowest mathematics and reading comprehension scores, while students without learning disorders in the classes with an increased number of lessons have the highest scores – was confirmed. The largest difference between the categories was 277 points in mathematics and nearly 310 points in reading comprehension, which could be considered very significant.

Our second hypothesis – students without learning disorders would participate more in in-school and extracurricular activities in all analyzed class types – was partially confirmed. A higher proportion of students with a learning disorder participated in tutoring and catch-up activities, but this was understandable given the nature of the learning disorder. The results showed that a higher proportion of students without learning disorders participate in the classes with standard curriculum and in intensive FLL, both inside and outside school; this was not the case for the classes with an increased number of lessons.

Our third hypothesis – family background influences student performance and participation in in-school and extracurricular activities – was confirmed. Students with better family backgrounds achieved higher results than both groups of students tested. By training types, there were much larger differences in family background in favor of the classes with an increased number of lessons. Family background was a determinant of student attendance in – presumably paid – extra lessons, for which the data suggest that parents appeared to have priority.

7 Conclusion

The aim of the study was to investigate the relationship between the training type, the presence of a learning disorder, participation in in-school and extracurricular activities, and the results of the competency measurement. In this study, we conducted a secondary analysis on the dataset of the National Competency Measurement of all tenth grade students in Hungary in 2019. The study of students with learning disorders is important because it is the largest group within the special educational needs category and the largest majority of these students who are integrated learners. In Hungary, educational selection on the basis of family background is very significant; this is also reflected in the differences between the different classes. The data show that those from the best family backgrounds are in the classes with an increased number of lessons, while those from the poorest family backgrounds are in

the classes with standard curriculum. Family background also determines the proportion of students who participate in activities inside and outside school. Priorities can also be seen in that even students from lower family backgrounds participate in extra lessons in mathematics, while less so in extra lessons in foreign languages or sports. There are also marked differences between the learning-disabled and non-learning-disabled groups by training type, with students with learning disorders scoring lower on competence performance outcomes. Students with a learning disorder have a much higher rate of participation in tutoring or catch-up courses. Family background, class, and participation in extracurricular activities are closely linked, because the better the family background, the more likely the student is to be in classes with an increased number of lessons, where the participation rate in extracurricular activities is much higher.

In the long term, the school system should provide care for students with learning disorders that would reduce disadvantages resulting from their family background. The school system should place more emphasis on students with learning disorders, which would require a central change. The research could be taken further by looking at concrete examples and at teacher views of the development of these students.

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