The Educational Success of Autistic Children in Mainstream Elementary Schools in Luxembourg (Supplement)

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This document appears as supplementary material in connection with the Luxembourg National Education Report 2024 – specifically as a translation of the following article:

Der Bildungserfolg autistischer Kinder in luxemburgischen Grundschulen
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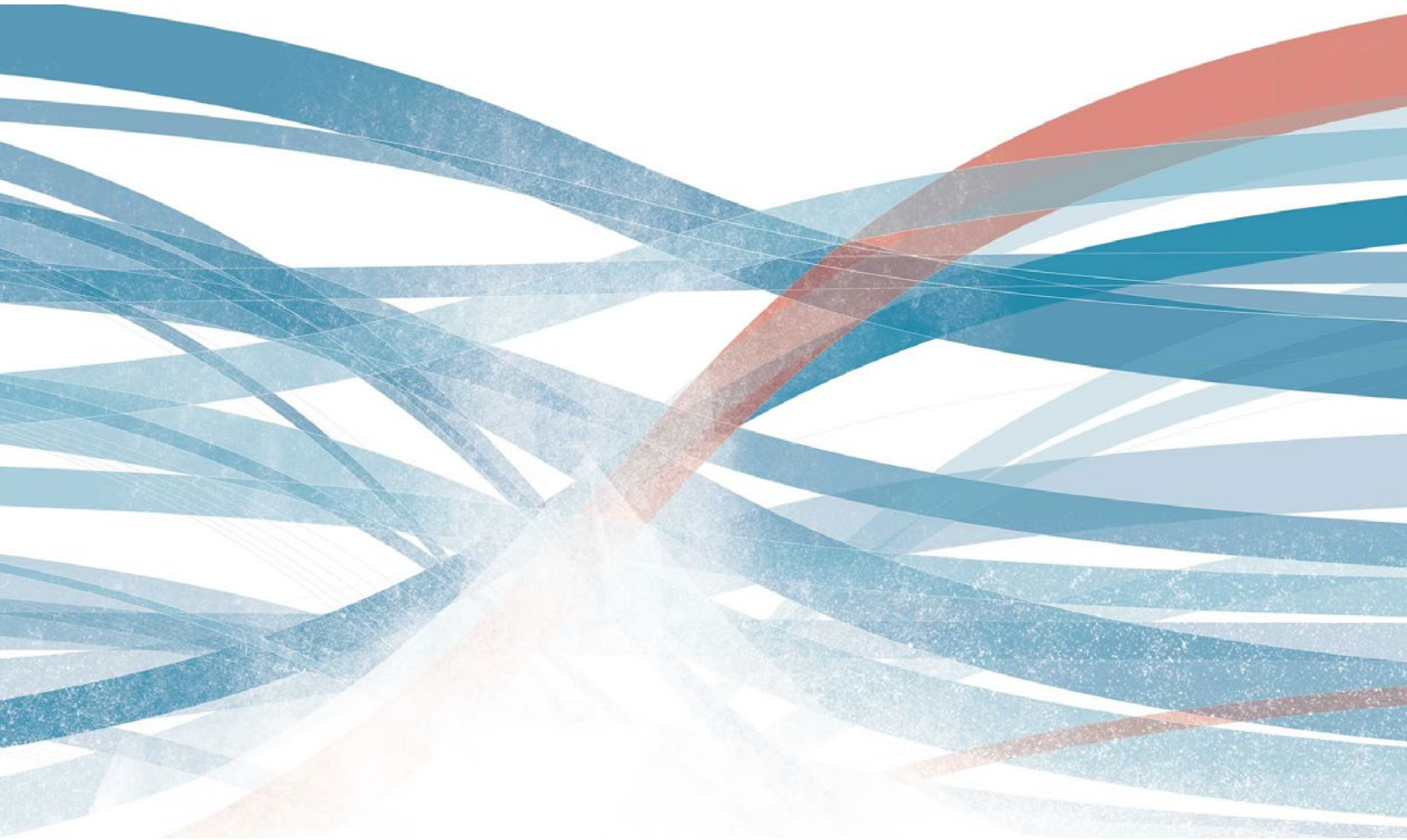
Suggested citation for this document:
Costa, A. & Franco, M. (2024). *The Educational Success of Autistic Children in Mainstream Elementary Schools in Luxembourg (Supplement).* Luxembourg Centre for Educational Testing (LUCET) & Service de la Recherche et de l'Innovation pédagogiques (SCRIPT). https://doi.org/10.48746/bb2024lu-en-15



The "Luxembourg National Education Report 2024" is published in German and French and can be accessed at the following link:

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Introduction

Autism is characterized by challenges in social communication, social interaction, and by restricted and repetitive patterns of behaviours and interests (American Psychiatric Association, 2015). In Luxembourg, the prevalence and incidence of autism remain unknown. However, according to recent reliable data from the American Centers for Disease Control and Prevention (Maenner, 2023), 1 in 36 eight-year-olds were identified with autism in 2020.

Based on their learning needs, which may depend on their intellectual disability, communication difficulties, and challenging behaviours, autistic children in Luxembourg might attend mainstream education schools with or without in-class assistance, special education schools (e.g., *Centre pour enfants et jeunes présentant un Trouble du Spectre de l'Autisme*, *Centre pour le Développement Intellectuel*), or a combination of both, with some days spent in mainstream schools and others in special education settings. Initially, many children with autism in Luxembourg start their education in mainstream schools (Costa & Steffgen, 2018). However, they often encounter challenges in following the academic curriculum.

There is considerable variability in the academic achievements of autistic children regardless of their intelligence quotient (IQ) (Keen et al., 2016). However, autistic children with average IQ are more likely to face school exclusion, compared to other children (Barnard, 2000). Moreover, multilingual environments like Luxembourg, where proficiency in multiple languages is required by the academic system, can pose additional challenge for autistic children. Lower proficiency in the language of instruction is known to be linked to reduced academic performance in children, in general (Greisen et al., 2018). Given the language difficulties of autistic children, the heightened linguistic demands may further impede social communication, potentially affecting their participation in class, interactions with teachers, and socialization with peers, ultimately impacting their academic success.

The widespread challenges that many autistic children encounter in their educational journey are of significant concern, as they can profoundly affect their well-being and prospects. The goal of this project is thus to inform effective support tailored to their needs. This study is part of a larger project ("Academic Success in Autism" funded by the Luxembourg National Research Fund) aimed to understanding the academic success of autistic children in Luxembourg compared to neurotypical[1] children.

[1] Neurotypical children are children who have brains that function in a way that is similar to most children.

Methods & Results

Families willing to participate in the study were recruited through mailing lists and social media and those who agreed to participate accompanied their children to our lab at the University of Luxembourg. While parents completed paper questionnaires, children engaged in tasks and assessments with a researcher in an adjacent room. Upon parental consent, we reached out to the children's class teachers via email and sent them paper questionnaires by mail. Our data collection encompassed *demographics*, *children's cognitive abilities*, *linguistic skills*, and *academic performance*.

Demographics. Table 1 provides a description of the autistic and neurotypical groups. Despite considerable heterogeneity among the groups, autistic children were statistically[2] similar to neurotypical counterparts in all these indicators and had a similar socio-economic status. All children attended elementary schools in Luxembourg.

Table 1. **Comparison between autistic and neurotypical children in demographic aspects**

	Autistic *n* = 19	**Neurotypical** *n* = 18	**Total** *N* = 37
Age	7 – 12 years	6 – 12 years	6 – 12 years
Gender			
Girls	4 (21%)	8 (44%)	12 (32%)
Boys	15 (79%)	10 (56%)	25 (68%)
School type			
Mainstream public school	11 (58%)	16 (89%)	27 (73%)
Other schools	8 (42%)	2 (11%)	10 (27%)

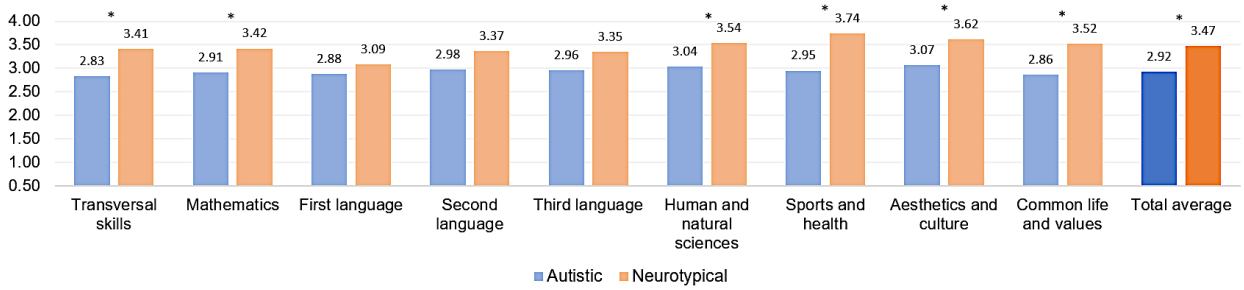
Cognitive abilities. All neurotypical children in this sample attended school without any support. In contrast, only two autistic children (representing 10.5 %) attended school without any form of assistance. The remaining 17 autistic children (89.5 %) received in-class support, either personal or general, with two of them attending a special education school for two days per week. Employing a non-verbal IQ assessment tool (Wechsler Nonverbal Scale of Ability; Wechsler & Naglieri, 2012), we found that, on average, autistic and neurotypical children demonstrated similar IQ levels: an average of 90 for autistic children and 96 for neurotypical children. It is important to note that engaging some children, both autistic and neurotypical, in IQ tasks proved challenging, likely resulting in an underestimation of their actual abilities.

[2] The presented results were subjected to statistical analysis, with reported differences or similarities having a probability lower than 5 % to be attributed to chance alone.

Linguistic skills. Teachers assessed children's proficiency in the language of instruction on a scale ranging from 1 = "very poor" to 7 = "excellent". Teachers rated autistic children (average = 4.27) as slightly less proficient in the language of instruction than their neurotypical peers (average = 4.74). However, this difference is not statistically significant.

Academic performance. We compared the most recent school report average grade of autistic and neurotypical children. To facilitate comparison across various school grading systems, all grades were standardized on a scale where "4" represented the highest possible grade. Autistic children, on average, achieved significantly lower grades than their neurotypical peers in several subjects (see figure 1). Although autistic children tended to have lower average grades in the 1st, 2nd, and 3rd languages, these differences did not reach statistical significance. When considering all school subjects collectively, autistic children maintained a significantly lower average grade compared to neurotypical children.

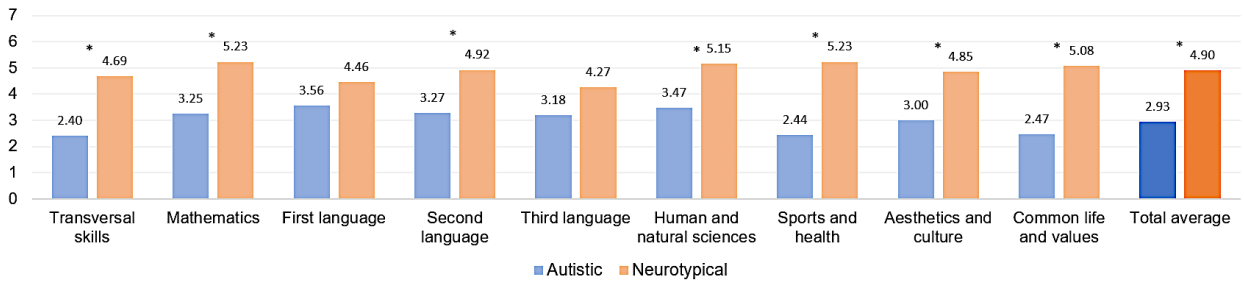
Figure 1. **School report grades per group and school subject**



Note: *statistically significant group differences

Subsequently, we evaluated children's academic performance through teachers' assessments of how each child performs in comparison to their classmates. Teachers provided ratings on a scale ranging from 1 = "much weaker" to 7 = "much stronger". Autistic children were assessed by their teachers as being weaker than their classmates across all school subjects. Conversely, neurotypical children were assessed as being as good or better than their peers across all school subjects, with an average rating of 4 of higher. This disparity in teachers' assessments of autistic versus neurotypical children's performance was statistically significant for most of the school subjects, apart from the 1st and 3rd languages (see figure 2).

Figure 2. **Teacher's assessment of children's academic skills per group and school subject**



Note: *statistically significant group differences

Discussion & Conclusions

This study provided insights into the academic performance of autistic children attending elementary schools in Luxembourg. Despite the considerable variability in intellectual ability, autistic children displayed, on average, an IQ comparable to that of neurotypical children. However, despite that, autistic children demonstrated significantly lower grades than their neurotypical counterparts across most school subjects. Furthermore, it is important to consider that some autistic children had adapted curriculums. It is thus possible that if autistic children would have been assessed in all subject areas, the disparity in grades compared to neurotypical children could be even greater.

This study was conducted with a relatively small sample size. However, despite this limitation, clear trends emerged, and these preliminary findings replicate for Luxembourg the results found in other countries, showing that autistic children tend to underperform compared to their neurotypical peers, regardless of their IQ (Ashburner et al., 2010; Mayes & Calhoun, 2003).

While the scope of this report did not encompass an in-depth analysis of reasons behind the underperformance of autistic children, it is suspected that various factors, including the school environment, available support structures, and the emotional and socio-communication challenges faced by many autistic children, play significant roles in their academic difficulties. These factors will be further explored and detailed in forthcoming publications.

Acknowledgements: This project is supported by the Luxembourg National Research Fund (FNR); Project reference number: 13651499.

References

Ashburner, J., Ziviani, J., & Rodger, S. (2010). Surviving in the mainstream: Capacity of children with autism spectrum disorders to perform academically and regulate their emotions and behavior at school. *Research in Autism Spectrum Disorders*, *4*(1), 18–27.

American Psychiatric Association. (2015). *Neurodevelopmental Disorders: DSM-5®*. American Psychiatric Pub.

Barnard, J. (2000). *Inclusion and autism: Is it working? 1,000 examples of inclusion in education and adult life from the National Autistic Society's members*. National Autistic Society.

Costa, A. P., & Steffgen, G. (2018). Luxembourg and Autism. In F. R. Volkmar (Ed.), *Encyclopedia of Autism Spectrum Disorders* (pp. 1–9). Springer New York.

Greisen, M., Hornung, C., Baudson, T. G., Muller, C., Martin, R., & Schiltz, C. (2018). Taking Language out of the Equation: The Assessment of Basic Math Competence Without Language. *Frontiers in Psychology*, *9*, 1076.

Keen, D., Webster, A., & Ridley, G. (2016). How well are children with autism spectrum disorder doing academically at school? An overview of the literature. *Autism*, *20*(3), 276–294.

Maenner, M. J. (2023). Prevalence and Characteristics of Autism Spectrum Disorder Among Children Aged 8 Years—Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2020. *MMWR. Surveillance Summaries*, *72*.

Mayes, S. D., & Calhoun, S. L. (2003). Ability profiles in children with autism: Influence of age and IQ. *Autism: The International Journal of Research and Practice*, *7*(1), 65–80.

Wechsler, D., & Naglieri, J. A. (2012). *Wechsler Nonverbal Scale of Ability* [dataset].