

This study provides an integrative and multidimensional perspective on linguistic and mathematical abilities and their relationship among children and adolescents with typical development, as well as adolescents with Autism Spectrum Disorder (ASD). In alignment with the global pedagogical trend that combines literacy with applied mathematics, there arises a need to investigate the relationship between linguistic skills and mathematics. The abstract nature of mathematics poses challenges for many children, including those with ASD, as they struggle to comprehend abstract concepts rooted in significant language components (Geary, 2004), potentially impacting their daily functioning.

The objective of this study was to explore the connection between linguistic skills (phonology, morphology, syntax, semantics, and pragmatics) and mathematical skills (procedural thinking, arithmetic understanding, and algebraic procedures) among three groups (ASD, TD1, TD2), encompassing a total of 107 subjects. This included 31 adolescents with ASD (24 boys and 7 girls), aged 12-19.2 ( $m = 15.8Y$ ,  $sd = 1.97$ ), 36 adolescents (27 boys and 9 girls) with typical development, matched in chronological age to the ASD group ( $m = 15.4 Y$ ,  $sd = 1.56$ ), and 40 typically developing children (16 boys and 24 girls) aged 10-11 years ( $m = 10.78Y$ ,  $sd = 0.42$ ).

Various research tools were employed to assess different aspects of language and mathematics, administered individually. Group-level data analysis included comparing linguistic and mathematical variables among the study groups and exploring relationships between language skills and math skills within these groups. Individual analyses were conducted for each participant in the ASD adolescent group, leading to the construction of personal profiles based on strengths and difficulties in the domains of language and mathematics, from which subgroups with common patterns were identified.

The study's findings in the domain of language skills indicated that both groups of teenagers (ASD and TD1) demonstrated similar abilities in phonology, semantics, and syntax, while showing differences in morphology and pragmatics. In contrast, significant disparities were observed in mathematical performance between the control groups and the ASD adolescent group. Adolescents with ASD exhibited lower performance across all domains compared to the two control groups. Among the group of adolescents with ASD, fewer correlations were observed between language and mathematics than in the two typically developing groups. The fields of morphology and pragmatics were identified as having the strongest connections within the ASD adolescent group. The most common profile among adolescents with ASD was characterized by uneven abilities in language and mathematics.

These findings lead to several conclusions: identifying specific language difficulties and implementing targeted interventions may alleviate these challenges and enhance mathematical skills. Furthermore, comprehensive instruction in the morphological field should be provided alongside language skill development. Additionally, the pragmatic field plays a crucial role in the success of mathematical skills. It is also possible that adolescents with ASD employ distinct cognitive strategies when learning mathematical skills. These results highlight the need for further extensive research to better understand the optimal methods for teaching and assessing these skills in children and adolescents with ASD.

