Development of a test battery to diagnose specific learning disorder in mathematics in a multilingual education context

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When suspecting a disorder in specific scholastic skills, e.g., in mathematics, individual weaknesses and strengths are identified in an extensive diagnostic process to provide adequate support. Given that most diagnostic instruments use a specific language to give instructions and present tasks, proficiency in the test language is likely to influence the student's test performance during diagnosis of specific learning disorders (Ugen et al., 2021). This becomes even more important in a culturally and linguistically diverse setting such as in Luxembourg. For specific learning disorders, it is recommended to test children in the main teaching language, which is German in Luxembourgish public schools. However, the majority of the enrolled pupils speak different languages at home and results of the national school monitoring program *ÉpStan* show marked differences in school performance between children with different language backgrounds (Hoffmann et al., 2018; Martini et al., 2021). Moreover, existing test batteries used in a diagnostic context mostly do not consider linguistic heterogeneity, and the fact that children have highly varying test language proficiency may result in over- or under-identification of learning disorders, which, in turn, may prevent children from receiving adequate support.

Therefore, we developed a new test battery specifically in the area of mathematics for children in grade 3, which is tailored to the multilingual education context in Luxembourg. Based on diagnostic guidelines and neurocognitive models of number processing, we identified two main domains: basic numerical and basic arithmetic skills, which are represented in 17 subtests with a total of 188 items. Additionally, two subtests measuring more general precursory skills were included. The instructions aimed to keep the language load low, and the test content was adapted to the national curriculum. The theoretical framework of the new test battery, as well as preliminary results of the first data collection will be presented (N = 211).

Keywords: learning disorders, mathematics, multilingual context, diagnostics, test development

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