In search of the cognitive profile of preschoolers at risk for dyslexia and ADHD

Silke Kellens, Dieter Baeyens & Pol Ghesquière

Parenting and Special Education Research Unit, Faculty of Psychology and Educational Sciences, KU Leuven, Leuven, Belgium

silke.kellens@kuleuven.be, dieter.baeyens@kuleuven.be, pol.ghesquiere@kuleuven.be

presented by Silke Kellens

Developmental dyslexia ('dyslexia') and attention-deficit hyperactivity disorder ('ADHD') co-occur frequently, as approximately 25-40% of children with dyslexia meet the criteria of ADHD. Children with a diagnosis of co-occurring dyslexia and ADHD have been found to show deficits related to dyslexia (i.e., phonological deficits), deficits related to ADHD (i.e., executive deficits and delay of gratification difficulties), as well as processing speed deficits. Compared to children with a single diagnosis, children of the double diagnosis group are often found to have more severe deficits. Because of the severity of their cognitive problems, and an increased risk of poor school performance, internalizing, and externalizing problems, early identification of these disorders is important. It is therefore key to acquire knowledge about predictors of these disorders, to identify young children at risk for developing co-occurring dyslexia and ADHD. However, up until now, young children (i.e., preschoolers) at risk for both dyslexia and ADHD are often neglected in research. We, therefore, believed that research at this point would benefit most from a full-factorial longitudinal study of preschoolers at risk for dyslexia and/or ADHD, beginning before reading instruction (preschool) and following them up from the starting phases of formal reading instruction (first grade) through the final stages of reading instruction (third grade).

The overall aim of this study was to compare the cognitive profile and development of a group of preschoolers (pre-reading) at risk for both dyslexia and ADHD (*n = 47)* to the profile of preschoolers at risk for dyslexia (*n = 49)* or ADHD (*n = 39*) and follow them up for 3 years. We compared these three preclinical groups to a group of average functioning preschoolers (*n = 47)*. In October 2018, we screened 1091 children (520 boys and 571 girls). Based on earlier longitudinal studies in this research group, we categorized participants at risk for dyslexia when they performed below percentile 25 on the most consistently found cognitive predictors of dyslexia, i.e., phonological awareness, rapid automatic naming, or letter knowledge, but did not perform above percentile 50 on any of these measurements. Children were considered as at risk for ADHD when they scored above the clinical cut-off of the Preschool Behavior Questionnaire (PBQ), i.e., above norm score 16 on either the inattention, hyperactivity, or impulsivity scale, filled in by their parents. Additionally, their scores on the 3 cognitive predictors for dyslexia were above percentile 40. Children who scored above percentile 40 on all 3 pre-

reading measures, but below 15 on the PBQ, were considered as controls for this study. Groups were matched on gender and had a nonverbal IQ of above 76.

All children were followed up longitudinally and tested at three points in time: in 3rd kindergarten (winter 2019), first (winter 2020) and third grade (ongoing data collection, to take place in winter 2022). They were assessed on several cognitive factors related to dyslexia (i.e., phonological skills), ADHD (i.e., executive functioning and delay of gratification), co-occurring dyslexia ADHD (i.e., processing speed), and academic achievement. Results revealed that children at risk for dyslexia (irrespective of ADHD status) showed phonological deficits in preschool and first grade. All children progressed in phonological skills from preschool to first grade, but those at risk for dyslexia (irrespective of ADHD status) did not reach the level of controls. Children at risk for ADHD showed executive deficits (only on verbal and visuospatial working memory), but only when they were also at risk for dyslexia. They did not show delay of gratification problems. Processing speed deficits were only present in the groups at risk for dyslexia, again irrespective of ADHD status. Last, as expected, children from the dyslexia risk group (with or without ADHD risk) performed poorly on measures of academic achievement, i.e., reading and spelling. In short, the cognitive profile of children at risk for dyslexia did not differ from the cognitive profile of children at risk for dyslexia and ADHD. Analogously, neither did the cognitive profile of children at risk for ADHD versus those without risk. These results indicate that heterogeneity in these preclinical groups is too large to detect group differences. Currently, data of wave 3 (third grade) are being collected. Additionally, parents are filling out questionnaires on possible clinical diagnoses of each child. Retrospective analyses of the cognitive profile in these clinical diagnosis groups will also be presented at the conference. Given the lack of research on preschoolers with a risk for dyslexia and ADHD, this research is not only of clinical value but can also add to the existing body of scientific literature.