

NAMING AND ATTENTIONAL DEFICITS IN PRE-SCHOOL AGE – DO THEY MAKE A DIFFERENCE TWO YEARS LATER?

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The Goal

The longitudinal Namex (Naming and Executive functions) -study examined, how impaired performance in Attention and Executive tasks at preschool-age predicted problems in AE functions two years later, and how naming skills predicted academic abilities. Three substudies were carried out targeting to executive functions, literacy and mathematics.

Participants

The clinical sample (n = 40) was recruited from the Neuropsychological Rehabilitation Center Nekku, which is a private clinic in a city in southern Finland. Children were referred to a neuropsychological evaluation for school-readiness at the age of 6. The sample of typically developing children (n = 32) was recruited from two preschools in the same city.

Methods

At the age of six the children were evaluated by the Wechsler Intelligence Scale for Children III, the Rapid Automatized Naming (RAN) of Colors, Objects and Numbers, the Sequence of Numbers and the Letter naming -tasks and the Boston Naming Test.

The NEPSY-battery was used at the ages of six and eight. Seven subtests from the NEPSY were chosen for the study. The subtests measured motor inhibition (the Statue and the Knock and Tap), auditory attention and shifting (the Auditory Attention and the Response Set), planning (the Tower), visual attention and fluency (the Visual Attention and the Design Fluency), and processing of sounds (the Phonological Processing). The tasks for the analysis were chosen, and the children were divided in groups according to the interest of each substudy.

At second grade the ATTEX (Attention and Executive Function Rating Inventory) -questionnaire was used to evaluate the executive problems of the children at behavioral level. Their literacy skills were evaluated by using the Lukilasse-test measuring reading speed, accuracy and comprehension as well as spelling. The WISC-III Arithmetic -test was used to measure the basic skills in mathematics.

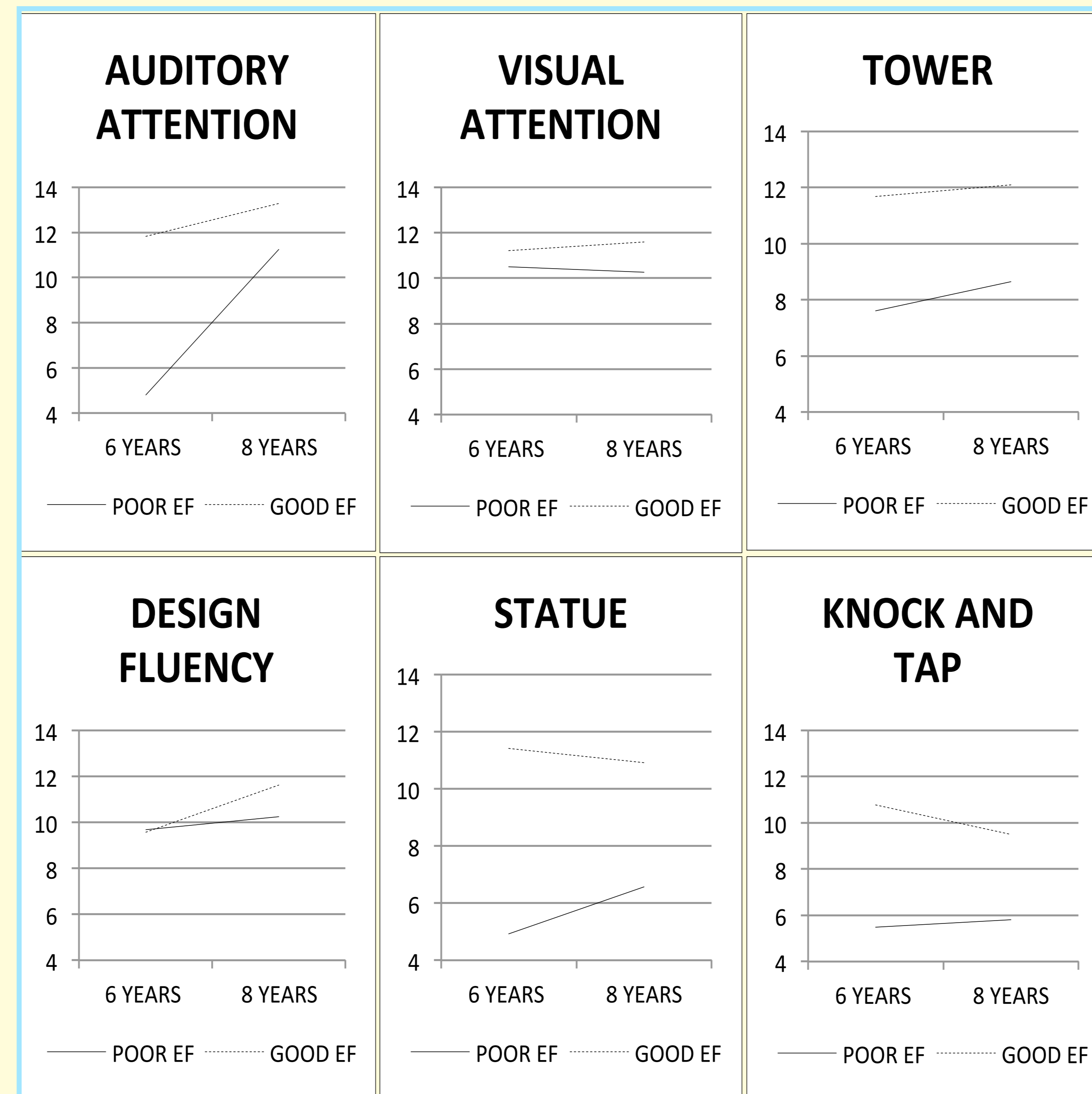


Figure 1. Longitudinal performance of the children in the typical (good) and atypical (poor) AEF groups in the subtests of attention and executive functions

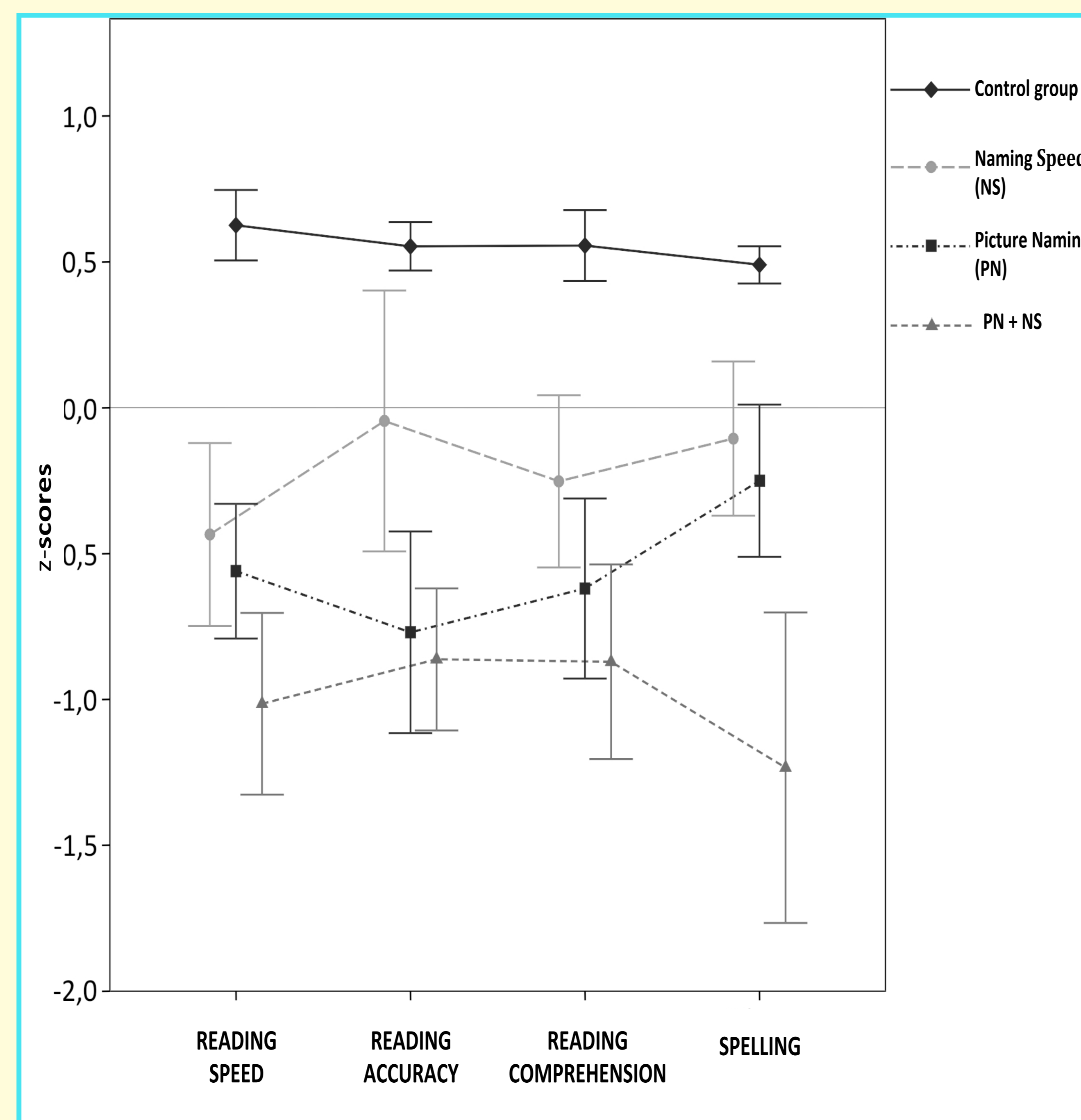


Figure 2. The differences of the means of the groups in reading and spelling tests at the age of eight.

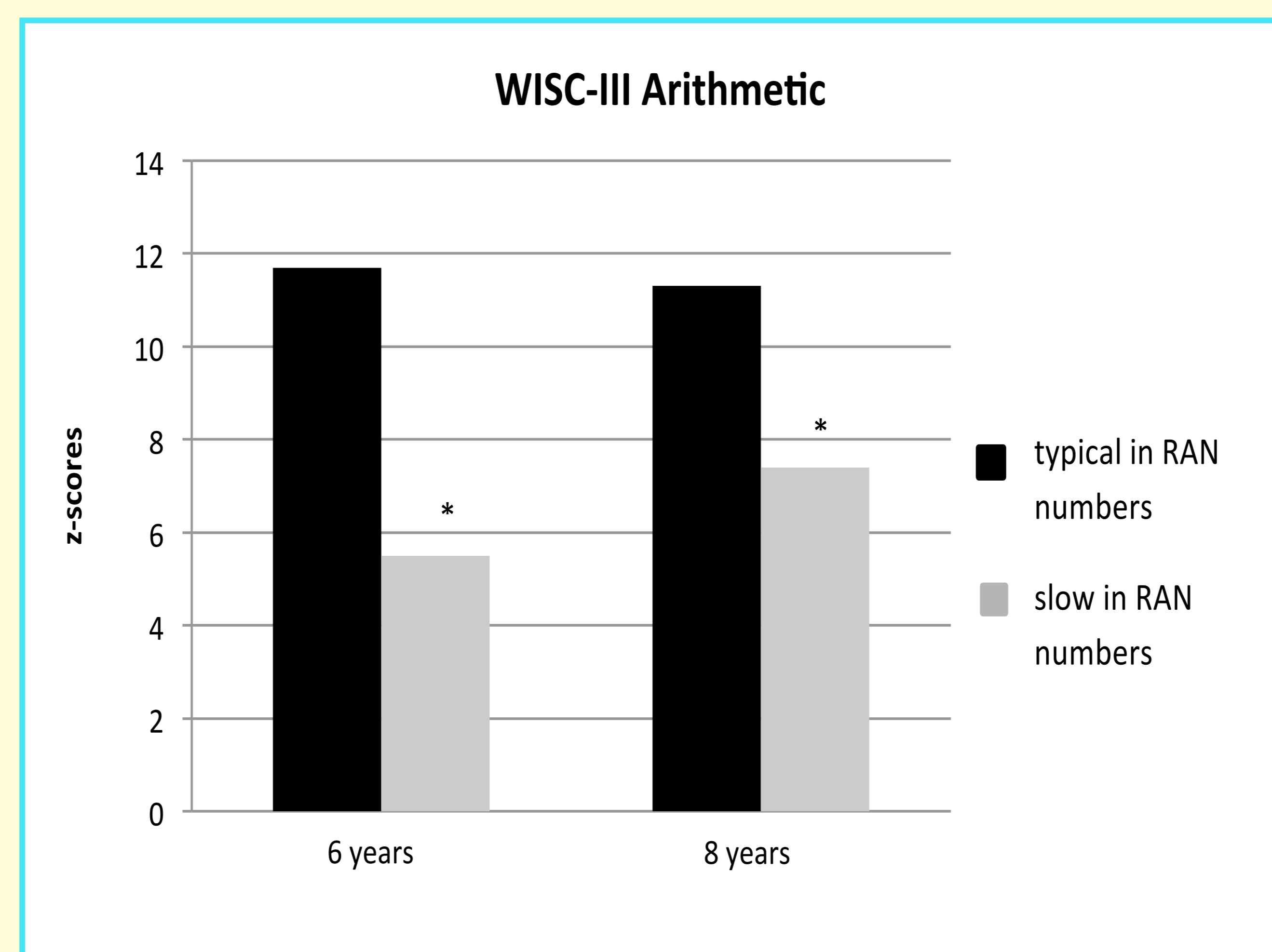


Figure 3. The differences of the means of the groups in WISC-III Arithmetic -test at the age of six and eight.

Results

Figure 1 shows the performance of the two groups (typical and atypical AEF) in the tests of attention and executive functions at the preschool at age of 6, and at the 2nd grade at the age of 8. Follow-up univariate analysis revealed significant main effect of group on the Tower, the Statue and the Knock and Tap. Standard scores were significantly lower in atypical AEF group in both measuring points. Controlling for IQ revealed that the effect of early AEF deficit goes over and beyond intellectual deficits.

Also, it was examined, how three separate naming skills (picture naming, naming speed and letter naming) predicted second-grade reading and spelling abilities among children with naming deficits and typically developing children.

Regression analyses showed that picture naming predicted later reading comprehension as well as reading speed and accuracy. As expected, naming speed predicted reading speed. Letter naming was a predictor of spelling. A general linear model indicated that deficits in both picture naming and naming speed are linked to more extensive difficulties in later reading ability than a deficit in only one of them (Figure 2).

At the age of six the group of children which was slow in naming numbers was poorer than the group of children having a typical number RAN in WISC-III Arithmetic -test. At the age of eight the difference between the groups was still significant (Figure 3).

Conclusions

The early problems in attention were still observable two years later. Especially inhibitory problems remained stable. Also, it was found out that a deficit in both picture naming and naming speed predicted more marked difficulties in later literacy skills than a deficit in only one of them. Slow naming speed of numbers was shown to be related to poor performance in the test of arithmetics.

The results of the study provide support for the use of different measures of inhibition, and the evaluation of various naming skills in neuropsychological assessment at preschool-age.

Literature cited

Berg, S., Poutanen, M., Kangas, T., Peltomaa, K., Korkman, M., Lahti-Nuutila, P. & Hokkanen, L. (2014). Naming skills as predictors of reading and spelling. *Psykologia*, 49, 41-63. (in Finnish.)

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