Research subject:
Reading and spelling difficulties

Theoretical framework, research design, findings, and relevance

There is convincing evidence that phonological awareness (PA), the sensitivity for and the ability to detect and manipulate the sound structure of a spoken word, is a strong predictor of early reading development, and that a deficit in PA typically characterizes children with, or at risk for, reading difficulties. However, a deficit in PA alone may not be sufficient to explain the heterogeneity of deficits seen in children with reading difficulties. The double-deficit hypothesis (DDH), is suggested to account for these individuals, which identify deficits in rapid automatized naming (RAN) as a second, independent predictor of reading difficulties (Wolf & Bowers, 1999). RAN is defined as the amount of time needed to name highly familiar symbols, such as digits, letters, colours, and objects. According to the DDH, three subtypes of individuals with difficulties in reading can be identified; a) the RAN-deficit subtype, defined by a RAN deficit but adequate PA abilities; b) the phonological-deficit subtype, defined by a PA deficit but adequate RAN abilities; and c) the double-deficit subtype, defined by a deficit in both PA and RAN. The DDH predicts that the double-deficit subtype represents the most impaired readers; followed by individuals in either one of the single-deficit groups, and that PA and RAN are separable deficits with independent negative effects on subsequent literacy development (Wolf & Bowers, 1999). Research has also suggested that the relative importance of PA and RAN on reading and spelling partly depends on the transparency and consistency between letters and sounds in different languages (Georgiou, Parrila, & Papadopoulos, 2008).

We investigated the DDH in a longitudinal dataset including children learning more (Norwegian/Swedish children, N=293) and less transparent orthographies (U.S. children, N=489; Australian children, N=264), followed from preschool to grade 2. Groups with double deficits, single deficits and no deficits were selected in preschool, kindergarten, and grade 1 and compared on reading and spelling skills in grades 1 and 2. In most analyses, there were no significant differences in reading and spelling across deficit groups, and this pattern of findings was identical across samples. Moreover, across countries, RAN-deficits showed stronger effect on reading whereas PA-deficits showed stronger effects on spelling. Overall, the results supported the basic premises of the DDH that RAN and PA are separable deficits with partly different effects on reading and spelling. The results also supported a universal view of literacy development, as we found similar predictive patterns of DDH subtypes across orthographies.

The importance of PA in early reading and spelling development is well established. The finding that RAN also have considerable impact on early literacy development must be taken into consideration when children are screened for potential difficulties in reading and spelling, and when reading instruction and intervention strategies are developed for the individual child.