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Cognitive neuropsychology and developmental dyscalculia.

Donlan, Chris, The development of mathematical skills. Psychology Press, Hove (ISBN 0-86377-817-8). 201-225 (1998).

In this chapter, we discuss a somewhat different source of data that can be brought to bear on the study of mathematical development, namely patterns of impaired performance seen in individuals with arithmetic learning disability (also referred to as developmental dyscalculia). In general, the use of performance data from neuropsychological populations is predicated on the assumption that such data are not merely aberrational, but rather reveal something about the ways in which cognition ordinarily takes place (see Caramazza, 1986). In the developmental case, the implication is that neuropsychological data reflect interruption in normal processes of knowledge or skill acquisition (e.g. Marshall, 1989). For instance, the discovery that individuals with developmental dyscalculia may suffer from selective disturbances in numeric abilities (e.g. reading or understanding numbers, retrieving arithmetic facts) would suggest that in normal development these skills are subserved by relatively distinct cognitive components. In the following sections, we first review some of the major findings from group studies and single-case descriptions of arithmetic learning disability. We then highlight a relatively new approach to the study of developmental dyscalculia - rooted in cognitive neuropsychology - and some preliminary findings stemming from this approach. We conclude with a discussion of research areas in which data from developmental dyscalculia may further enhance our understanding of normal mathematical development. (Introduction)

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