

Multi-element processing in developmental dyslexia: evidence from single case studies and data modelling

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Multi-element visual processing deficit was investigated in young developmental dyslexic patients by means of report tasks within a multiple-case approach. A computational model of the attentional involvement in multi-object recognition [Bundesen, C. (1990). *A Theory of Visual Attention*. *Psychological Review*, 97(4), 523-547.] was further used to fractionate individual performance into different theoretical components. By combining psychophysical measurements and computational modeling, we demonstrated that multi-element processing deficit in dyslexia stem from at least two distinct cognitive sources: a limitation of the maximal number of elements extracted from a brief visual display and stored in visual short term memory, and a reduction of the rate of information uptake.

Selective deficit of orthographic input lexicon in two Italian surface dyslexics

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Background: Surface dyslexia is characterized by a selective deficit in reading irregular words, coupled with spared ability to read regular words and non-words, which reflects a deficit located in the lexical route. In Italian, only stress assignment errors can reveal surface dyslexia. Indeed, Italian orthography is completely transparent at the segmental level, but stress of most polysyllabic words is assigned lexically and cannot be derived by using grapheme-to-phoneme conversion rules. In the literature, only two Italian surface dyslexics have been described, showing either a deficit of the phonological output lexicon (Miceli and Caramazza, 1993) or a progressive disorder of the lexical-semantic system (Chiacchio et al., 1993). Methods: We report on two Italian brain-damaged patients with acquired surface dyslexia who underwent a thorough neuropsychological investigation of cognitive and reading abilities. Results: In reading, both patients produced almost exclusively stress assignment errors. Their ability to read non-words was spared, and showed a preference for the more frequent stress pattern. Also tasks requiring lexical decision and comprehension of homophones were impaired. Discussion: The patients' performance appears to rely almost exclusively on sub-lexical mechanisms, pointing for the first time to damage at the level of the orthographic input lexicon in Italian surface dyslexics.