Developmental and acquired Surface dyslexia and Anomia as a result of a shared deficit in phonological output lexicon

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Introduction

Lexical retrieval and oral reading are often depicted in two separate models. However, they are not completely separate, as they share components. This study assessed the effect of an impairment in a shared component, the phonological output lexicon, on lexical retrieval and oral reading.

Lexical retrieval is a multi-level process: conceptual system- semantic lexicon- phonological output lexicon- phonological output buffer. Naming difficulties can result from a deficit in each of these stages.

One of the clinical challenges in anomia is to detect the locus of the impairment in the lexical retrieval process. This is done on the basis of analysis of naming error types, the assessment of various effects on naming, and the performance on additional tasks. Oral reading also relies on a multi-level process, which starts with the orthographic-visual analyzer, proceeds, in the lexical route, to the orthographic input lexicon, the phonological output lexicon, and the phonological output buffer. Information also flows from the orthographic input lexicon to the semantic lexicon and the conceptual system for reading comprehension. On the sub-lexical route, information flows from the orthographic-visual analyzer to grapheme-to-phoneme conversion, whose results are held in the phonological output buffer.

Surface dyslexia (SD) is a deficit in the lexical route, which forces reading aloud via the sublexical route. There are three subtypes of surface dyslexia: a deficit in the orthographic input lexicon, a deficit in the output of the orthographic input lexicon to the phonological output lexicon and the semantic system, and interlexical SD, a disconnection between the orthographic input lexicon and the phonological output lexicon. In all these types oral reading of irregular words and potentiophones (none read as "known") is impaired. They differ with respect to lexical decision and comprehension of potentiophones/homophones.

Given that both naming and oral reading share the phonological output lexicon, in the current study we explore the pattern of reading of individuals with phonological output lexicon anomia.

Method

Seven individuals, three with acquired anomia and four with developmental anomia, showed significant naming disorders. An extensive test battery diagnosed their deficit in the phonological lexicon output. All were affected by word frequency and manifested typical errors, with preserved nonword repetition and word comprehension.

We administered oral reading tests of words sensitive to SD: irregular words and potentiophones; pseudohomophone lexical decision; and orthographic homophone/potentiophone comprehension, to assess the orthographic input lexicon and its connection to semantics.

Results

The oral reading of all phonological output lexicon participants revealed the typical surface dyslexia errors. Importantly, all the participants performed flawlessly on pseudohomophone lexical decision and on homophone/potentiophone reading comprehension.
indicating spared orthographic input lexicon and spared access from it to lexical semantics.

**Discussion**

The phonological output lexicon is involved both in naming and oral reading, and indeed the seven participants with acquired and developmental anomia in the phonological output lexicon showed anomia as well as SD in oral reading. This suggests a principled relation between reading and naming, points to a new cause for surface dyslexia, and suggests that oral reading of irregular words and potentiophones may be instrumental in diagnosing a lexical-phonological output deficit.