



Prefixation in a Case of Deep Dyslexia and Neglect

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Prefixation in a case of deep dyslexia and neglect.

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Introduction:

Neuropsychological investigations on lexical morphology using reading aloud as a main task have been conducted in cases of deep dyslexia/phonological (DD), a result of damage to the left hemisphere, and of neglect dyslexia (ND), mostly resulting from damage to the right hemisphere. Both conditions reflect the mental organization of complex words. In DD reading is possible only via the lexicon; errors of morphological nature derive from the fact that complex words may be stored as decomposed in root and affixes (Patterson, 1980); affixes are thus prone to omission or substitution with other affixes. In ND the left side of words is ignored: morphological boundaries, rather than merely spatial factors have been shown to modulate reading (Reznick and Friedmann, 2015; Semenza et al. 2011). The two conditions, resulting from damage to different hemispheres, are unlikely to coexist in the same case. The combination of the two has never been reported in neuropsychological studies of morphology. Thus, Case DE, presenting with an unusual combination of DD and ND allows interesting observations about the processing of complex words. Prefixed words were used in this investigation because they have morphological elements at both the left and the right ending.

Methods:

Patient DE, 63 y.o., was affected by fronto-temporal dementia (*MMSE*: 13/30; *MoCA*: 9,11/30). A left hemi-spatial neglect (*BIT*: 47/146) including ND was shown. In reading non-prefixed words, prevalence of left-sided errors emerged (Fig.1).

A clear pattern of DD was additionally observed (words better than non-words, morphological and semantic errors).

DE was administered 210 prefixed Nouns (N) and 105 Past Participles (P) to read aloud. "Root boundedness" (bound vs. free) and "semantic transparency" (transparent vs. opaque) were considered. Nouns were thus divided in four types: Bound Opaque (BO: *antipatia*-antipathy), Pseudo-prefixed (PP: *antichità*-antiquity), Free Transparent (FT:

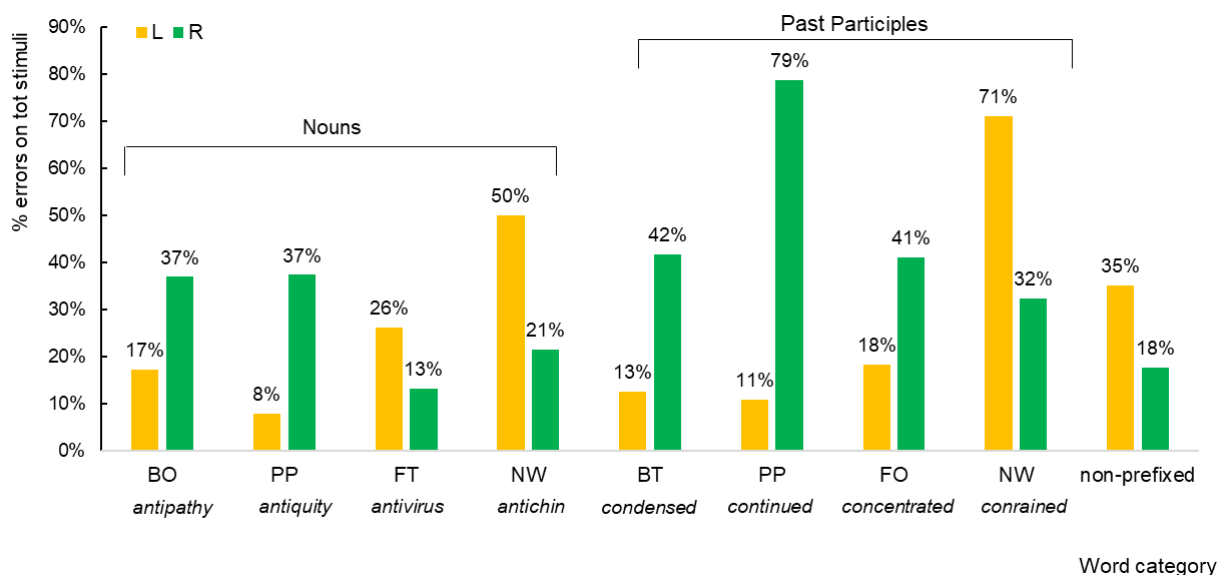
antivirus-antivirus) and Prefixed Non-Words (NW: *antimento-antichin*). Participles types were: Bound Transparent (BT: *condensato-condensed*), Pseudo-prefixed (PP: *continuato-continued*), Free Opaque (FO: *concentrato-concentrated*), and Prefixed Non-Words (NW: *conpiovuto-conrained*).

Word length, word frequency, type of prefix and prefix frequency were matched across categories. Stimuli were administered singularly in random order at the center of a monitor screen (80 pt.), with no time constraints.

Results:

On prefixed words, DE committed about as many errors on the left as on the right side ($\chi^2 = 2.712, p = 0.099$). The majority of errors were classified as *morphological* (prefix/suffix omissions/substitutions). Importantly, errors distributed unequally between the right and the left side across categories ($\chi^2 = 44.626, p < 0.001$). Words likely represented as whole-units (i.e., PP, BO, BT, FO) showed a higher proportion of right-sided errors, relatively saving the prefixes. In contrast, words likely stored as parsed (FT) or those lacking a lexical entry (NW), showed higher rates of left-sided errors.

Figure 1



Conclusions:

These results provide striking evidence that attention to written material is modulated by lexical information. DD would enhance the likelihood of committing morphological errors on

words whose internal representations are likely to be stored as decomposed. Prefixes of these words seem to be more sensitive to the effects of ND.

References:

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