Linearity and Word Internal Structure in the Visual Processing of Italian Prefixed and Suffixed Words
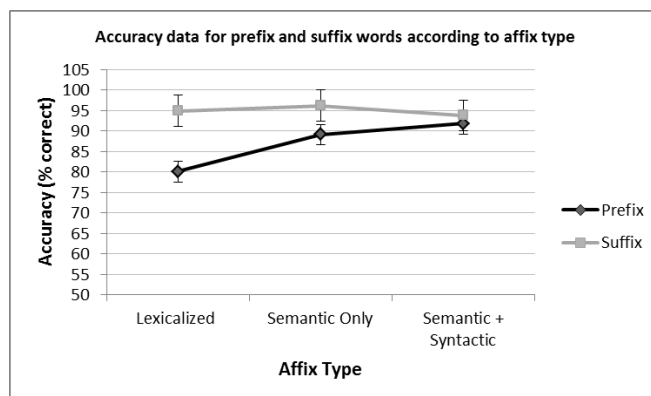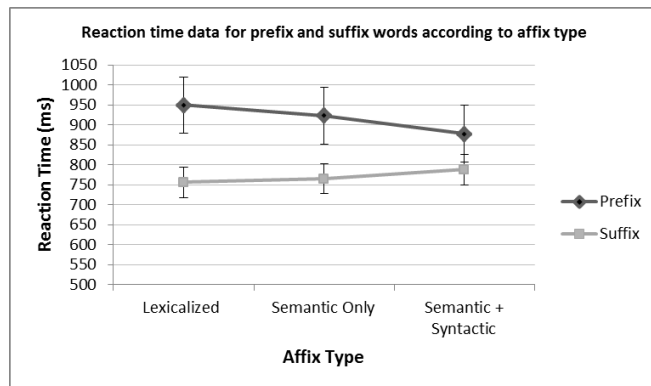
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The access and processing of complex poly-morphemic words has been the subject of much debate. Specifically, it is unclear whether such words are stored and accessed as (i) distinct morphemes (Taft et al., 1975), (ii) as whole words (Cole et al., 1989), (iii) as both morphemic and whole forms accessed in parallel (Caramazza et al., 1988, or (iv) whether morphemes are not represented discretely, but emerge from the overlap of semantic, phonological and orthographic codes (Gonnerman et al., 1999). In this talk we present the results of two repetitions of a pair of lexical decision experiments conducted to address this theoretical debate by manipulating the linearity (i.e., sequential order of morphemes, Hudson et al., 1995) and word internal structure of Italian prefixed and suffixed words. To our knowledge, this is the first study to systematically investigate both of these variables in Italian. We will also highlight how our results question certain theoretical assumptions of the lexicalist approach to word formation processes with regards to lexicalized and productive derived words.

The study involved comparing three different kinds of affixes in both prefixed and suffixed words: (1) syntactic affixes that change the grammatical class of the stem in addition to modifying it semantically (e.g., amministra[V]zione[N] 'administration' in-grand[A]-ire[V] 'enlarge'); (2) semantic affixes that only modify the base semantically (e.g., matit[N]-ina[N] small pencil' and ri[V]-fare[V] 'redo'), and (3) "lexicalized" words with an unproductive affix/stem that has lost its semantic transparency (e.g., pallino 'bullet', rimanere 'to stay'). Twenty words were generated for each of the 3 word types along with filler words for both the prefix and suffix tasks. Critical words were matched on the basis of frequency, familiarity, number of syllables, and language code across conditions. Participants consisted of 120 native speakers of Italian, half of which were randomly assigned and run through either the prefix or suffix condition which was treated as a between-subjects variable. Structural complexity, as quantified by the number of processes involved in forming and recognizing words, was expected to produce longer RTs and lower ACC with increasing word complexity, with lexicalized words resulting in the fastest and most accurate responses based on the assumption that they are stored and processed as whole words (Schreuder et al. 1994).

Similar to Cole et al. (1998), we found a significant main effect of linearity with suffixed words generally responded to faster and more accurately than prefixed words. However, linearity was also found to interact with structural complexity, such that prefixed and suffixed words produced opposite effects. For prefixes, syntactic words resulted in the fastest RT and highest ACC with lexicalized words responded to most slowly and least accurately. By contrast for suffixes, syntactic words showed the slowest responses and lexicalized words the fastest, although ACC across suffix conditions was generally constant, as indicated in the two graphs below. Structural complexity therefore affected suffixed words as expected, such that more complex words required longer processing times; whereas prefixes, due to their position at the beginning of words, seem to privilege syntactic-category information so that it is processed first (Friederici et al., 2007). The lexicalized word results further indicate that derived words are not necessarily processed faster or slower than simple words (Bertram et al., 1999), but that their processing varies according to the sequential order of morphemes and the information encoded in the affix. Strictly dichotomous claims that derived words must be stored and accessed in either decomposed or whole word forms, or via two distinct routes, are therefore inadequate. Instead, the present findings are most consistent with connectionist constraint satisfaction theories of lexical processing (Mirkovic et al., in press; Plaut & Gonnerman, 2000).

At theoretical level our results show that lexicalist claims such as that features have no structure and that words are 'atomic' at syntactic and semantic level (Lapointe 1979, Williams 1978) are difficult to account for at processing level because words were found to elicit different RTs according to their structural differences. Finally, the surprising findings obtained with lexicalized words challenge what different theoretical approaches to morphology assume regarding these words. Lexicalized words of all types are generally assumed to be exceptions that are learned by rote, stored in whole word form, and hence excluded from lexicalist rules. Our results demonstrate that the processing of lexicalized words is significantly affected by their internal structure because resulting RTs were aligned with the RTs of productive words of the same prefixal or suffixal class, with the lexicalized words actually showing the largest differences.

Reaction time data for prefix and suffix words according to affix type

Accuracy data for prefix and suffix words according to affix type

Selected Bibliography

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