Reduplicated words are automatically decomposed, even when they are fake: MEG evidence from Tagalog pseudoreduplicants

Samantha Wray (New York University Abu Dhabi), Alec Marantz (New York University, New York University Abu Dhabi) and Linnaea Stockall (Queen Mary University of London)
samantha.wray@nyu.edu

Morphologically complex words are decomposed in the visual system based on their orthographic properties such that forms which imitate a morphological form (e.g. *brother*) are decomposed automatically even in the absence of any morphological relationship between their parts (Rastle et al. 2004). However, these effects have been attested primarily for languages with concatenative morphology. Thereby the system could also be characterized as a matter of exhaustive linear parsing. For languages with non-linear morphological processes like reduplication, the nature of decomposition is unexplored. Is reduplication subject to automatic decomposition? Furthermore, are words which phonologically conform to the appearance of reduplication but lack the morphosyntactic and semantic features of a reduplicated word treated as reduplicated words by the visual system?

This study aims to answer these questions in visual word recognition in Tagalog. First, the study compares processing of words formed through reduplication to words with affixes and to morphologically simple words. Second, there is a class of Tagalog words that only appear to be reduplicated but do not have an independent stem and lack the morphosyntax of a reduplicated word (termed “pseudoreduplicants” by Zuraw (2002)). There are two types of pseudoreduplicants: One of them applies the rules of Tagalog phonology transparently (Wilbur 1973, McCarthy 1995). For example, the vowel preceding a word-final consonant in Tagalog is realized as [o] but is [u] in other positions. The pseudoreduplicant *dubdob* “feeding a fire” conforms to this phonological rule. The second type of pseudoreduplicant does not apply these rules transparently. The word *gonggong* “fish”, for example, does not exhibit transparent application of the o->u rule; it remains an 'o' in the two vowels of the word. The non-transparent pseudoreduplicants imitate real reduplicants, because real ones (e.g. *boboto* “shall vote”; stem *boto* “vote”) do not apply this rule transparently either. The question then arises: are transparent pseudoreduplicants processed differently from non-transparent reduplicants given that the latter imitate reduplicants?

Participants (n=22) performed a lexical decision task on visually presented words (120 target items) in five classes: (1) reduplicated words (*boboto*), (2) pseudoreduplicated words which imitate reduplicants (*gonggong*), (3) pseudoreduplicants that do not (*dubdob*), (4) morphologically complex affixed words (*ka-ruwag-an*) and (5) morphologically simple words (*aberya*). Magneto-encephalography was recorded concurrently and evoked responses were investigated for spatio-temporal clusters of activity in the left hemisphere using a mass-univariate ANOVA. Particular attention was paid to spatiotemporal clusters in the occipital lobe within the range of the M170 and later clusters in the frontal lobe.

A significant cluster (Fig. 1) was found in the pericalcarine region at 65ms-365ms after stimulus presentation. In this spatio-temporal cluster, reduplicated words significantly differed from morphologically simple words and morphologically complex affixed words (Fig. 2). Furthermore, the emergence of a later cluster in the superior temporal region from 100ms-400ms (Fig. 3) was consistent with the hypothesis that transparent pseudoreduplicants are processed differently from non-transparent pseudoreduplicants: in this frontal region, transparent pseudoreduplicants are not significantly different from morphologically simple words (Fig. 4). However, nontransparent pseudoreduplicants are significantly different from morphologically simple words.

Our results suggest two important implications that inform our understanding of the neural correlates of morphological decomposition. First, reduplication is comparable to affixation in that it is automatically parsed by the visual system during word recognition. Second, phono-orthographic cues to morpheme boundaries aid in this automatic decomposition; words which are not real reduplicants but appear to be superficially due to their application of phonological rules are also decomposed.

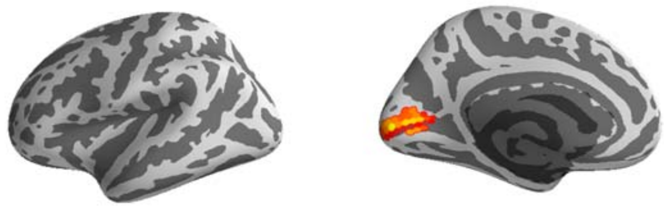

Figure 1: Cluster of activity in pericalcarine area.

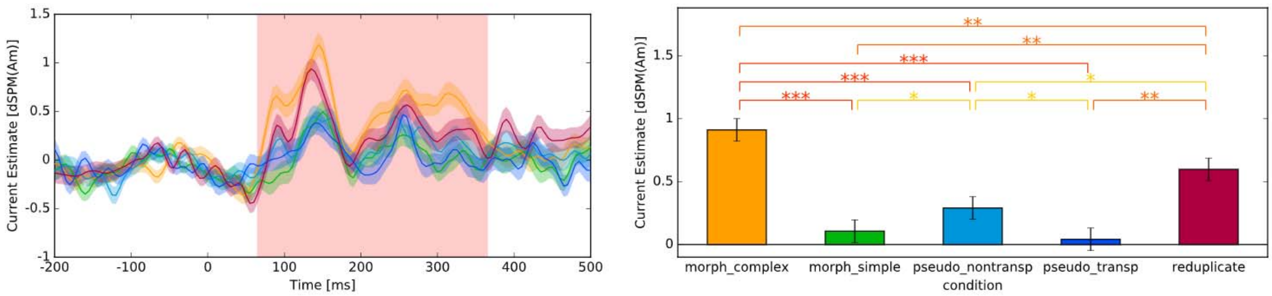

Figure 2: Time course and average activity in spatio-temporal cluster in pericalcarine area correlated with condition (word type), as well as pairwise comparisons for levels of condition.

Figure 3: Cluster of activity in superior frontal area.

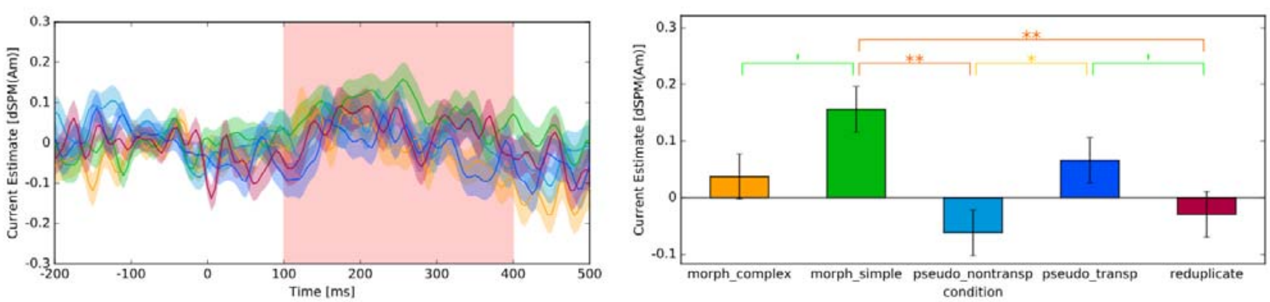

Figure 4: Time course and average activity in spatio-temporal cluster in superior frontal area correlated with condition (word type), as well as pairwise comparisons for levels of condition.

*** p < .001   ** p < .005   * p < .05   ‘ p < .1