The Generation of Prosodic Frames in Speech Production:  
An Experimental Approach  
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It has been argued that speech production involves the generation of a series of representations during different processing stages (Levelt, 1989). Only recently have language production models begun to address the shape of the underlying representation in post-lexical processing stages. These models maintain that prosodic frames are arranged according to the prosodic structure of the utterance, as opposed to its lexical or syntactic structure (Roelofs 1997).

Theories of phonological phrasing (e.g. Selkirk 1978, 1981, 1986; Nespor & Vogel 1986; Lahiri & Plank 2010) assume that prosodic units are not isomorphic with syntactic units. However, theories are not transparent about the prosodic status of compounds: although a noun-noun compound in English consists of two lexical words (and therefore two prosodic words), it can also act as a single prosodic item by exhibiting main stress on the first unit and carrying inflection. Recursive word formation may suggest that compounds are a single prosodic unit. Additionally, evidence from psycholinguistic tasks measuring speech latencies has indicated that compounds elicit naming latencies similar to morphosyntactically-simple words in native Dutch and European Portuguese speakers (Wheeldon & Lahiri 1997, 2002; Vigario 2010). However, little is known about the phonological encoding of these items in English. Our research question is as follows: what dictates the prosodic framing for complex morphosyntactic items such as compounds?

To examine this, we conducted two tasks containing two sets of English stimuli: noun-noun compounds, adjective-noun phrases, disyllabic initial-stressed words, and disyllabic final-stressed words (monosyllabic in Experiment 2).

<table>
<thead>
<tr>
<th>Comp</th>
<th>AdjN</th>
<th>‘Syl’</th>
<th>‘Syl’ / Mono</th>
</tr>
</thead>
<tbody>
<tr>
<td>graveyard</td>
<td>green yard</td>
<td>gravel</td>
<td>gazelle / grape</td>
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Experiment 1 looked at how compounds were planned in native British English speakers, using both delayed and online task conditions. In the delayed task, speakers were given time (800 ms, 1000 ms, or 1200 ms) to plan their utterances. After the experimental prompt, they answered a question (e.g. what was it?) using the target item they saw on the screen (e.g. it was GRAVEYARD). Experiment 2 presented the target stimuli in online task conditions, where speakers to begin speaking immediately after the question. This task used a monosyllabic word instead of a final-stressed word as one of the control conditions.
In Experiment 1, adjective-noun phrases elicited significantly longer (486 ms, p < .006) naming latencies than all other conditions, while compounds showed no difference (444 ms) to either disyllabic word condition (all p’s > .5). In Experiment 2, adjective-noun phrases elicited significantly shorter (249 ms, p < .005) naming latencies than both compounds (273 ms) and disyllabic words (275 ms). Notably, the mean naming latency for the phrasal condition was statistically-similar (p > .5) to the monosyllabic condition.

In the delayed priming task, reaction times reflected the total number of prosodic units in the target sentence. In the online task, however, speech latencies only reflected the complexity of the first prosodic unit. Taken together, these results suggest that, despite containing two lexical and prosodic words, English compounds are planned as single prosodic units. These findings lend support to the claim that it is in fact the prosodic structure (not the lexical or morphosyntactic structure) of the utterance that is dictating the arrangement of prosodic frames during the post-lexical encoding stages of language production.