

Compound prosody in context: The case of English noun-noun compounds

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Background and Research Question

Reference grammars of English describe compound nouns as either left-stressed (e.g., *Oxford Street*, *opera singer*) or right-stressed (e.g., *Oxford Road*, *summer dress*) (Bauer, Lieber, & Plag, 2013 p. 447). However, empirical research shows that compound prominence is not categorical but probabilistic, influenced by lexical-semantic factors such as semantic relations, category membership, and specificity (e.g. Plag, Kunter, Lappe, & Braun, 2008; Bell & Plag, 2012). Furthermore, variation occurs not only between compound types but also within a given type, indicating that speaker and context may contribute to shaping compound stress. While Bell (2015) addressed the role of speaker, previous accounts have largely ignored contextual effects. This study focusses on pitch (f₀), which is known to play an important role in the perception of stress. We investigate to what extent the pitch contours of English noun-noun compounds can be explained by existing stress-based accounts when context is considered alongside compound type and speaker.

Methodology

We analysed compounds spoken in context from the Boston University Radio Speech Corpus (Ostendorf, Price, & Shattuck-Hufnagel, 1996), which includes news stories read under laboratory conditions by professional newsreaders. Because all speakers read the same texts containing a variety of compounds, the corpus allows us to examine the contributions of compound type, speaker, and context to prosodic realisation. Each token's prosodic form was represented as a smoothed pitch contour extracted using the rPraat package in R (Bořil & Skarnitzl, 2016). To identify contour patterns, we applied k-means clustering for longitudinal trajectory data. A two-cluster solution provided the best fit, indicating that pitch contours are indeed best described by two distinct trajectory types (see Figure 1).

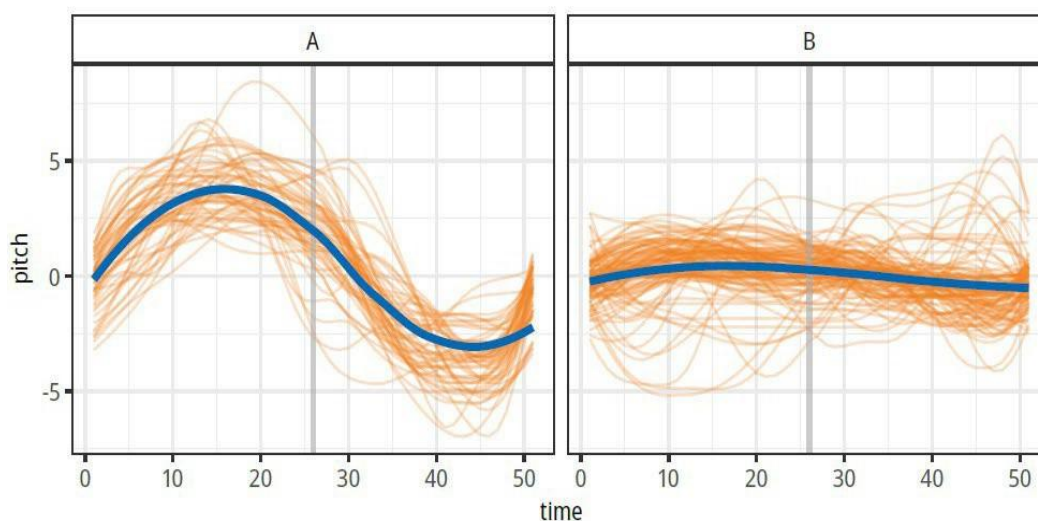


Figure 1: Pitch contours of the two clusters, with a non-linear average smooth indicating the general trend in the data (within-constituent time-normalized data). The vertical line indicates the constituent boundary.

We then fitted generalised linear mixed-effects models to predict cluster membership based on compound, speaker, and context, as well as generalised additive models to predict pitch as a function of time, i.e. to predict the trajectories of individual pitch contours.

Results and Conclusion

Our models show that compound type, speaker, and context all influence pitch contours, though the nesting of type and context limits precise estimation of their individual effect sizes. Speaker appears to be a weaker predictor than either type or context, suggesting that contextual and lexical factors play a more prominent role in shaping pitch contours. Contextual effects appear to dominate at the coarse level of cluster membership, i.e. pattern A or pattern B, while compound type plays a stronger role at the level of within-cluster variation. There appear to be compound-specific effects that modulate the phonetic detail of the coarser, cluster-level intonational patterns. Qualitative analysis further reveals that contrastiveness and information status - both aspects of context - affect pitch implementation: first mentions tend to exhibit pronounced pitch excursions, while given information is associated with flatter contours. These findings demonstrate that stress variation in compounds cannot be fully explained by type-based accounts alone; both speaker and contextual factors interact with lexical properties to shape pitch realization, highlighting the need for models of compound prosody that integrate discourse-level considerations.

References

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