Acoustic Cues to Syntactic Structure

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\section*{Introduction}

- Stems longer in monosyllabic words for Germanic languages (Beckman & Edwards, 1990)
- Stromswold et al. (under review)
- Listeners can predict syntax before hearing verbal inflection
- Rehrig et al. (2015)
- Linguistically naïve speakers lengthen passive verb stems
- Monosyllabic lengthening? (“kick-ing” vs. “kicked”)
- Phrase-final lengthening? (active vs. passive)
- Potential effect of allomorphic verb ending /t/, /d/, or /ad/

\section*{Materials}

\textbf{Progressive active:} The \textbf{__} was \textbf{__}-ing the \textbf{__}.
\textbf{Passive:} The \textbf{__} was \textbf{__}-ed by the \textbf{__}.
\textbf{Perfective active:} The \textbf{__} has \textbf{__}-ed the \textbf{__}.

\section*{Methods}

- Each verb occurred in each sentence type
- Each noun appeared in 1\textsuperscript{st} and 2\textsuperscript{nd} position
- 15 verbs x 3 sentence types x 2 noun positions
- 90 experimental sentences & 120 fillers

\section*{Results}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{results.png}
\caption{Sentence Type Analyses}
\end{figure}

\textbf{Sentence Type Analyses}

Main effect of sentence type ($F(2, 347) = 14.74, p = .005$)
- Progressive actsives shorter than passives ($p < .001$) & Progressives shorter than perfectives ($p = .002$).
- Perfective actsives shorter than passives ($p = .028$).

\textbf{Allomorphic Ending Analyses}

Main effect of verb ending ($F(2, 347) = 24.19, p = .004$).
- /d/ verbs > /t/ verbs > /ad/ verbs

By participant:
1. /d/ & /t/ verbs > /ad/ verbs
2. /d/ & /t/ verbs > /ad/ verbs
3. /d/ verbs > /t/ verbs > /ad/ verbs
4. /d/ verbs > /t/ & /ad/ verbs

\section*{Discussion}

\textbf{Implications}

- Effects of both syntax and phonology
  - Phrase-final lengthening suggested by difference in “has kicked” vs. “was kicked”
  - Monosyllabic lengthening implicated by difference between “was kicking” & “has kicked”
- Passive stems consistently longer than progressive active stems, despite individual differences
- Effect of allomorphic verb ending
  - In passives/perfectives, bisyllabic verbs (those with syllabic /ed/) shorter than monosyllabic verbs (those with /t/ or /d/)

\textbf{Future directions}

- Some fillers were ambiguous through the word “has” (eg “The child has kittens to take care of” vs. “The child has kicked the bully”)
- Are acoustic cues that differentiate these structures present in or before “has”?

\section*{References}


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