Using Acoustic Cues to Resolve Tense Ambiguity
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Background
Stromswold et al., under review
- A linguistically-trained speaker unconsciously lengthened the verb stem in passive sentences
  - Active: The sheep was kissing the pig
  - Passive: The sheep was pushed by the pig
- In comprehension studies, native English-speaking adults seem to use the verb stem difference to disambiguate actives and passives
- In a production study (Rehrig et al., 2015), 7 out of 7 naive English-speaking adults lengthened the passive verb stem
- These studies only used the auxiliary verb was

Research Questions
- Do people also lengthen the passive verb stem when the passive auxiliary is in the present tense?
- Are there other acoustic cues?

Methods
Participants: 2 adult monolingual English-speakers
Production Task: Read sentences aloud
Stimuli: Active/Passive x Past/Present x NP order x 10 Verbs
Verbs: Chase, Kiss, Lick, Pat, Poke, Punch, Tickle, Trap, Wash
- 40 was sentences: The sheep was kissing the pig
  The pig was kissed by the sheep
- 40 is sentences: The sheep is kissed by the pig
  The pig is kissing the sheep

Coding:
- Morpheme boundaries marked
- Morpheme duration, pitch and intensity calculated

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<thead>
<tr>
<th>Duration</th>
<th>Is Auxiliary Results</th>
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<td><img src="duration_graph.png" alt="" /></td>
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<tr>
<td>Participant A</td>
<td>Participant B</td>
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<tr>
<td>There were no active/passive differences in pitch for either participant</td>
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<tr>
<th>Pitch</th>
<th>Is and Was Results</th>
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<td>Participant A</td>
<td>Participant B</td>
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<td>There were no active/passive differences in pitch for either participant, besides ing/ed</td>
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<th>Intensity</th>
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Discussion
- Passive verb stem lengthening is a robust phenomenon
  - Found in both participants
  - Found with past and present auxiliary verbs
  - Found in both naive and linguistically trained participants
- Passive verb stem lengthening may be a reflection of phonology
  - Speakers try to keep words around the same length
  - Passive suffix [-ed] is shorter than active suffix [-ing]
  - Lengthening the passive verb stem makes the passive and active verbs more similar in length

Future Directions
- Comprehension study: Who uses these acoustic cues?
  - Effect of age: When do children begin to use these cues?
  - Effect of first language: Do non-native English speakers use them?
  - Effect of fluency: Do professional interpreters use them?
- Gating study: Guess the completion The pig was shove___
- Eye-tracking study: When do people figure out what the sentences mean?

Acknowledgments
This work was supported by the Aresty Foundation and the National Science Foundation (REU CNS-1062735, IGERT DGE 0549115). We are grateful for the feedback from Aresty & 2014 Perceptual Science and Technology REU mentors.