PRESENT
PRESEN T  PRESEN T

(Noun)  (Verb)
PROSODY
Visual Prosody
to Improve the Expressive Reading of Readers with Hearing Loss

* Funded by a University Grant; No financial relation with or any obligation to Microsoft other companies exists for this study.
Introduction into prosody
Prosody is not about what we say, but about how we say it.
That old man can’t understand you very well.
   —The reader does not know on which word
   the original speaker/writer laid emphasis.

That old man can’t understand you very well.
   —That man we currently are looking at.

That old man can’t understand you very well.
   —But that young man can.

That old man can’t understand you very well.
   —But the old lady can.

That old man can’t understand you very well.
   —Whatever he will do, it is impossible for him.

That old man cannot understand you very well.
   —He has something that hinders him.

That old man can’t understand you very well.
   —Do something about your speech?

That old man can’t understand you very well.
   —He has difficulties to understand it.
Put the books on the table in the living room.
—The meaning is open for interpretation.
Put the books on the table in the living room.
—You can put the books there.
Put the books on the table in the living room.
—Move those books to the living room.

Example based on Wagner & Watson, 2010
‘chocolate, cake, and biscuits’
‘chocolate-cake and biscuits’
‘The boy is happy.’
vs.
‘The boy is happy?’
Individuals with hearing loss could encounter hindrances in perceiving and producing prosody, even with a CI.
Research question:

“What can we do to *improve* and *train* their speech prosody?”
Research methods
Prosody = variations in loudness, duration & pitch.
We can encourage speech prosody through variations in the letters.

These visualizations = ‘*visual prosody.*’
De arme man bleef alleen achter.

Weight for loudness

De arme man bleef alleen achter.

Wider text for duration

De arme man bleef alleen achter.

Vertical position for pitch

De arme man bleef alleen achter.

Enlarged space for pause/separating parts
Results
Influence on the average loudness

Lighter  Lower  Normal  Wider  Raised  Smaller  Thicker
De groenten koken in een pot op het vuur.

De groenten koken in een pot op het vuur.
De groenten koken in een pot op het vuur.

De groenten koken in een pot op het vuur.
Ze gingen in de boomgaard fruit plukken.
Ze gingen in de boomgaard fruit plukken.
Ze gingen in de boomgaard fruit plukken.
Ze gingen in de boomgaard fruit plukken.
Influence on the average pitch

- Lower
- Normal (highlighted)
- Lighter
- Wider
- Smaller
- Thicker
- Raised
Je kan een speld horen vallen.

Je kan *een* speld horen vallen.
Je kan een speld horen vallen.

Je kan een speld horen vallen.
<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of occurrences</th>
<th>Average duration</th>
<th>Std Dev</th>
<th>Minimum duration</th>
<th>Maximum duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>No large space</td>
<td>1101</td>
<td>1.0000000</td>
<td>0.6267851</td>
<td>0.0754717</td>
<td>6.0621359</td>
</tr>
<tr>
<td>Large space</td>
<td>144</td>
<td>4.2633618</td>
<td>2.9867084</td>
<td>0.1898305</td>
<td>18.5384615</td>
</tr>
</tbody>
</table>
Ik zit in de zetel met een tas warme melk.

Ik zit in de zetel met een tas warme melk.
Ik zit in de zetel met een tas warme melk.
Ik zit in de zetel met een tas warme melk.
Every Sunday I bike to grandmother.
  o Not on Wednesday.
  o Every week again.
  o She lives far away.
  o My brother does not join.

Every Sunday I bike to grandmother.
  o Not on Wednesday.
  o Every week again.
  o She lives far away.
  o My brother does not join.
66% found the intended meaning, without any explanation!
Conclusions & Take-away messages
This approach to visual prosody is able to encourage expressive reading without an extensive explanation.
Speech therapists and educators can apply visual prosody in reading materials aimed at expressive reading.
There is more to come.

Prosody is closely related to reading comprehension. What influence would visual prosody have?

Marschark & Hauser, 2008; Wauters, Bon, & Tellings, 2006
A request for you:
Any more examples of visual prosody?

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Thank you all!