1. Started by asking myself, what do I already know about the prosodic hierarchy from spoken languages?

<table>
<thead>
<tr>
<th>level</th>
<th>what counts as one?</th>
<th>intra-linguistic variability?</th>
<th>cross-linguistic variability?</th>
<th>observable consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>syllable</td>
<td>usually, sonority peak (nucleus) and surrounding material</td>
<td>not much</td>
<td>• lots of variation in what is a permissible syllable</td>
<td>stress rules count syllables</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• some variation in how to divide the same string into syllables</td>
<td>• e.g., stress second-to-last syllable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>o e.g., a.pla vs. ap.la</td>
<td></td>
</tr>
<tr>
<td>prosodic word aka phonological word</td>
<td>roughly syntactic word o could include clitics, exclude some affixes</td>
<td>not much</td>
<td>yes: what can be a clitic, which affixes can be independent</td>
<td>is domain of stress rules</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• stress second-to-last syllable of prosodic word</td>
</tr>
<tr>
<td>accentual phrase</td>
<td>one or two content words, plus surrounding function words</td>
<td>yes: size depends on speech rate</td>
<td>yes: languages vary in whether they use AP and/or iP</td>
<td>in a pitch-accent language, only one lexical pitch-accent can surface per AP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• can have a characteristic post-lexical melody</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>o e.g. Seoul Korean LHLH</td>
</tr>
<tr>
<td>intermediate phrase</td>
<td></td>
<td></td>
<td>yes: languages vary in whether they use AP and/or iP</td>
<td>can be domain of downstep</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>o if there is H LH in an iP, second H is lowered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>one postlexical pitch accent per iP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>often has a boundary tone at end</td>
</tr>
<tr>
<td>phonological phrase (some researchers use AP and iP; others p-phrase)</td>
<td>generally projected in some way from syntactic XPs</td>
<td>some: often there’s an option to combine two p-phrases into one</td>
<td>yes: quite different rules across languages</td>
<td>pitch can be reset at beginning of new iP</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>o e.g. is it the beginning or the end of the XP that matters?</td>
</tr>
</tbody>
</table>
| intonational phrase | roughly a sentence, but a sentence can be broken into multiple IPs  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>o parentheticals, lists, long subjects, etc.</td>
</tr>
<tr>
<td>yes: slower speech</td>
<td>more IP boundaries</td>
</tr>
<tr>
<td>not so much: the same factors seem to matter cross-linguistically</td>
<td></td>
</tr>
</tbody>
</table>
|                     | • often has a boundary tone at end  
|                     | • often followed by a pause  
|                     | • pitch can be reset at beginning of new IP                      |

| utterance | roughly a sentence, but two short sentences can be joined together if they have a tight relationship  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>o e.g. ellipsis, anaphora, implied <em>because</em></td>
</tr>
<tr>
<td>yes: whether to combine two sentences into a single utterances is very optional</td>
<td></td>
</tr>
<tr>
<td>not so much: the same factors seem to matter cross-linguistically</td>
<td></td>
</tr>
</tbody>
</table>

| most levels: | • consonants at beginning of domain have stronger articulation  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>o e.g., more contact between tongue and palate</td>
</tr>
<tr>
<td></td>
<td>• sounds at end of domain have longer duration</td>
</tr>
</tbody>
</table>

| most levels: | • there are phonological rules that apply only at certain domain edges  
|---------------|------------------------------------------------------------------|
|               | o e.g., word-final obstruent devoicing  
|               | o e.g., English syllable-initial aspiration                      |
|               | • there are phonological rules that apply only if their structural description (target+environment) is all contained within a certain domain  
|               | o e.g., assimilate nasal to following stop iff they are in the same intonational phrase |
2. **Main findings in these two papers for Israeli Sign Language (ISL)**
   - End of phonological phrase gets prominence
     - expected, given head-complement word order
   - There is an assimilation rule whose domain is phonological phrase
   - Facial expressions mark intonational phrases

3. **Nespor & Sandler’s assumption for how phonological phrase is projected from syntax**
   - lexical head X, plus everything on its nonrecursive side, until you hit another head outside
     X’s maximal projection
     - so in a head-complement language (right-recursive), a lexical head’s p-phrase
       includes preceding material
     - and, the last word of the p-phrase is prominent

   - in some languages, a non-branching complement can be included in its head’s p-phrase

4. **Examples of sentences from their corpus**
   - vecchia is inside sbarra’s maximal projection
   - [la vecchia sbarra] [la porta] **Italian**
     the old bar it carries ‘The old bar carries it’
   - [hanno parlato] [bene]… ~ [hanno parlato bene]…
     they.have spoken well
   - [hanno parlato] [molto bene]…, *[hanno parlato molto bene]
     they.have spoken very well

(N&S p. 160)
5. Example of prosodic coding

(24) ‘The book he wrote is interesting.’

<table>
<thead>
<tr>
<th>Movement</th>
<th>(book)</th>
<th>(he write)</th>
<th>(interesting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>brows</td>
<td>up</td>
<td>down</td>
<td></td>
</tr>
<tr>
<td>eyes</td>
<td>squint</td>
<td>droop</td>
<td></td>
</tr>
<tr>
<td>cheeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mouth</td>
<td>‘O’</td>
<td>down</td>
<td></td>
</tr>
<tr>
<td>tongue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>head</td>
<td>tilt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mouthing</td>
<td>‘book’</td>
<td>‘interesting’</td>
<td></td>
</tr>
<tr>
<td>torso</td>
<td>lean</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hold</td>
<td></td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>reduplication</td>
<td>-1</td>
<td>×3</td>
<td>×4</td>
</tr>
<tr>
<td>pause</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>speed</td>
<td></td>
<td>slow</td>
<td></td>
</tr>
<tr>
<td>size</td>
<td>big</td>
<td>big</td>
<td></td>
</tr>
</tbody>
</table>

6. Phonetic properties of p-phrase

236/247 p-phrases in corpus had at least one of the following—and usually just one

- Reduplication on last word of p-phrase
  - more repetitions than that word lexically requires
  - suggests that prominence is phrase-final
  - moreover, non-final signs of p-phrase often have fewer repetitions than lexically required
- Hold after last word of p-phrase
  - hands freeze briefly at end of phrase
- Pause after p-phrase
  - hands relax towards neutral configuration and position
7. **Spreading rule**

- Weak hand’s shape and location for head word can spread all across the p-phrase

![Sign Language Images](image)

- You have to be careful about excluding certain cases:
  - part of a sign can get used as a classifier
    - e.g. ‘The street, I crossed’ (topicalized)
    - weak hand of street used as classifier for rest of sentence
  - if there’s another two-handed sign, it interrupts spreading
    - so there are cases where you can’t tell whether it’s the p-phrase boundary that stopped spreading, or another two-handed sign
  - also, if there’s both a p-phrase boundary and an intonational-phrase boundary in the same place, you can’t tell which is responsible

⇒ their claim that the domain of spreading is the p-phrase is based on not very many tokens (9!), but exceptionless

*another example, Sandler p. 201*

```
[[MALE HUMAN-CLASSIFIER THERE]\p]\l
[I PERSUADE STUDY]\p]\l
```

‘I persuaded him to study’

Normally STUDY is one-handed
8. **Edge-marking in intonational phrases**
   - head position changes at boundary between two IPs
   - facial expression changes at boundary between two IPs
   - eye blink usually happens at end of IP rather than elsewhere

9. **Final prominence in intonational phrase**
   - last p-phrase of IP can have same facial expression, but intensified
     - e.g. contract bottom eyelids during first p-phrase, add contraction of top eyelids for second and final p-phrase of IP
   - longer holds and pauses
   - more repetitions in reduplication
   - slower rate
   - bigger gestures

10. **Intonation: facial expression analogous to postlexical melodies in spoken languages**
    - e.g. English H* L% for declarative sentences, L* H% for yes/no questions
    - Facial expression extends over whole IP
examples from N&S p. 170

**Figure 4:** yes/no questions

- brows up
- widened eyes
- head forward

‘Did you eat?’

**Figure 5:** shared information

- contracted eyelids
- (raised cheeks)

‘That movie that we were talking about is now playing in Haifa’

**Figure 6**

yes/no questions + shared information

- brows up
- widened (top) eyelids
- head forward
- contracted (bottom) eyelids
- (raised cheeks)

‘Have you seen that movie?’

(that we were talking about)
and from Sandler pp. 208-209

**Figure 7:** *Wh*-question superarticulation

“furrowed brows and a forward head position”
from ‘Where is the house’

**Figure 8:** Shared information superarticulation

“squinted eyes”
from ‘The house we were talking about is there’

**Figure 9:** *Wh*-question and shared information superarticulation

from ‘Where is that house we were talking about?’
11. Back down to the level of the prosodic word...
- combination of lexical word and cliticized function word gets reduced to one syllable
  - so it counts as one p-word
- if content word is mouthed, mouthing extends over whole p-word
  - no separate mouthing for clitic

*examples from Sandler p. 174*

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**Figure 1:** SHOP, citation form

**Figure 2:** SHOP-HERE, cliticized form with h2 coalescence
• though you can’t totally see it from just these stills, SHOP-THERE apparently has the mouthing of Hebrew Xanut ‘shop’, not šam ‘there’
• Clitic also assimilates in handshape
  o because a p-word can only have one group of selected fingers

Figure 3: Pronoun, I (citation form)  (Sandler p 195)

Figure 4: I, cliticized with handshape assimilation from READ
(Sandler p. 196)—in this one, note also the weak hand spreading, since I-READ is also a single p-phrase