Week 5. Optional infinitives, Unique Checking Constraint, ATOM, …

Two hypotheses about learning

- **LLEE (late learning early emergence)**
  - A “commonsense” view—
  Things which “emerge” emerge early. Things which are learned appear later.
  Implies that parameters should be set late too (since at least the settings are learned)

- **VEPS (very early parameter setting)**
  Basic parameters are set correctly at the earliest observable stages, that is, at least from the time that the child enters the two-word stage around 18 months of age.

- **VEKI (very early knowledge of inflection)**
  At the earliest observable stage (two-word stage), the child knows the grammatical and phonological properties of many important inflectional elements of their language.

Two-word stage?

- The reason both VEPS and VEKI mention the two-word stage is just because this is the first stage where we have evidence of utterance composition.

Optional Infinitive stage

- Root infinitives are possible grammatical sentences;
- These infinitives co-exist with finite forms;
- The children know the relevant grammatical principles (and how they distinguish finite from nonfinite).

Optional Infinitive Stage

- German: V2/SOV; kids put finite verbs in second position, leave nonfinite verbs in clause-final position
- French: V-->I; kids move finite verbs to I, leave nonfinite verbs in VP.
Very Early Parameter Setting

- As soon as you can see it, kids have:
  - VO vs. OV order set (Swedish vs. German)
  - V--->I [yes/no] (French vs. English)
  - V2 [yes/no ] (German vs. French/English)
  - Null subject [yes/no] (Italian vs. Fr./E.)
- So, at least by the 2-word stage, they have the parameters set (maybe earlier)

VEPS and the theory of learning

- If parameters are set by the time kids are using multi-word utterance, no negative evidence could have played a role.

Null subjects…

- Null subject parameter is not initially mis-set (kids don’t all start off speaking Italian—contra Hyams 1986); rather, child null subjects are (at least in part) due to the availability of non-finite verbs (the OI stage).
- Some null subjects are licensed by being the subject of a nonfinite verb (i.e. PRO)
- But there are some null subjects with finite verbs…

Topic drop

- Where kids drop the subject of a finite verb, perhaps this is “Topic-drop”
- Proposal:
  Topic-drop applies to Very Strong Topics

  Kids sometimes take (in reality) non-VS topics to be VS topics (a pragmatic error)

Prediction about NS

- OI’s have two ways of licensing NSs:
  - PRO (regular licensing of null subject)
  - Topic drop
- Finite verbs have one way to license a NS:
  - Topic drop
- So: We expect more null subjects with root infinitives (which we in fact see)

Bromberg, Wexler, wh-questions, and null subjects

- If topic drop is something which drops a topic in SpecCP…
- …and if wh-words also move to SpecCP…
- …we would not expect null subjects with non-subject (e.g., where) wh-questions where the verb is finite (so PRO is not licensed)
Bromberg, Wexler, *wh*-questions, and null subjects

- And, that’s what they found:

Finiteness of null and pronominal subjects in Adam’s *wh*-questions (Bromberg & Wexler 1995)

<table>
<thead>
<tr>
<th></th>
<th>Finite</th>
<th>Nonfinite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null</td>
<td>2</td>
<td>118</td>
</tr>
<tr>
<td>Pronoun</td>
<td>117</td>
<td>131</td>
</tr>
</tbody>
</table>

*Rizzi’s “truncation” theory predicts:*
- No *wh*-questions with root infinitives
  - *wh*-question $\Rightarrow$ CP, but
  - CP $\Rightarrow$ IP, and
  - IP $\Rightarrow$ finite verb
- And of course we wouldn’t expect null subjects in *wh*-questions if null subjects are allowed (only) in the specifier of the root.

*But…*

- German and Dutch have *extremely few* root infinitives when there is anything in SpecCP.
- But they are V2 languages—finite verbs are what you find in C, and when SpecCP is filled, there must be something in C. Hence, the prediction seems to be:
  - V2 languages $\Rightarrow$ no *wh*-question root infinitives

**VEKI?**

- Generally, *when kids use inflection, they use it correctly*. Mismatches are vanishingly rare.
  - English (Harris & Wexler 1995)
  - German (Poeppel & Wexler 1993)
- Again, this is kind of contrary to what the field had been assuming (which was: kids are slow at, bad at, learning inflection).

**ATOM**

- Adult clause structure:

```
  AgrP
  /  \
NOM_i Agr' \
  /    /   \
Agr TP   T'
 /     /    /     /
l_T   l_T     l_T
   T    T      T    VP
```
Why either missing TP or AgrP gives us a root infinitive (DM)

- In English, we have the following rules for pronouncing this tense/agreement affix:
  
  - (V+)T is pronounced like:
    - /s/ if we have features [3, sg, present]
    - /ed/ if we have the feature [past]
    - Ø otherwise

One prediction of ATOM

- +AGR +TNS: NOM with inflected verb (-s)
- +AGR –TNS: NOM with bare verb
- –AGR +TNS: default (ACC) with bare verb
- –AGR –TNS: GEN with bare verb (not discussed but see Schütze & Wexler 1996)

- Nothing predicts ACC with inflected verb.

EPP and missing INFL

- Prior to splitting into AgrSP and TP, the hypothesis was that IP was missing and that IP was responsible for both NOM and tense.
- Yet, there are many cases of root infinitives with NOM subjects (atom:+Agr –Tns)
- And, even ACC subjects seem to raise out of the VP over negation (me not go)

*Truncation again

- Incidentally, Rizzi’s “truncation” theory has the same problem—if root infinitives are missing everything above tense, how come so many bare forms surface with NOM subjects? And why do the subjects raise past negation, and to where? Topic?! Bah.
Wait—how can you say kids are UG-constrained yet drop T/Agr?

- So, aren’t TP and AgrSP required by UG? Doesn’t this mean kids don’t have UG-compliant trees?
- Actually, perhaps no. UG requires that all features be checked, but it isn’t clear that there is a UG principle that requires a TP and an AgrP in every clause.

Wait—how can you say kids are UG-constrained yet drop T/Agr?

- Perhaps what requires TP and AgrP are principles of interpretation…
- You need TP so that your sentence is “anchored” in the discourse.
- You need AgrSP … why? Well, perhaps something parallel…?
- Regardless, kids can check all the uninterpretable features even without TP or AgrSP; hence, they can still be considered to be UG-constrained.

NS/OI

- Some languages appear not to undergo the “optional infinitive” stage. How can this be consistent with a maturational view?
  - OI languages: Germanic languages studied to date (Danish, Dutch, English, Faroese, Icelandic, Norwegian, Swedish), Irish, Russian, Brazilian Portuguese, Czech
  - Non-OI languages: Italian, Spanish, Catalan, Tamil, Polish

NS/OI

- What differentiates the OI and non-OI languages?
- Agreement? Italian (non-OI) has rich agreement, but so does Icelandic (OI).
- Null subjects!

- Null Subject/OI Generalization: Children in a language go through an OI stage iff the language is not an INFL-licensed null subject language.

NS/OI and Hebrew (Rhee & Wexler 1995)

- Hebrew is a NS language but only in 1st and 2nd person, non-present tense. Everywhere else (3rd past, future, present) subjects are obligatory.
- Hebrew-learning 2-year-olds showed optional infinitives except in 1/2-past, and allowed null subjects elsewhere, with infinitives.

<table>
<thead>
<tr>
<th>kids up to 1;11</th>
<th>1/2 past/fut (NS)</th>
<th>else (non-NS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>null subjects</td>
<td>0 (of 21)</td>
<td>32% (36/112)</td>
</tr>
<tr>
<td>overt subjects</td>
<td>0 (of 6)</td>
<td>0 (of 28)</td>
</tr>
</tbody>
</table>

NS/OI and Hebrew (Rhee & Wexler 1995)

<table>
<thead>
<tr>
<th>all OI kids</th>
<th>1/2 past/fut (NS)</th>
<th>else (non-NS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>null subjects</td>
<td>0.6% (1/171)</td>
<td>25% (85/337)</td>
</tr>
<tr>
<td>overt subjects</td>
<td>1.4% (1/72)</td>
<td>0.6% (3/530)</td>
</tr>
</tbody>
</table>
The UCC

• **Unique Checking Constraint**
The D-feature of a DP can only check against one functional category

• Adults must check the D feature of the subject *both* in TP and in AgrSP. Kids only get one, so they have to choose: Omit TP, Omit AgrSP, or ignore the UCC.

“Minimize Violations”

• The poor kid with the UCC is faced with a dilemma. It knows that it must obey three things, but it *can* obey only any two:
  – Realize tense
  – Realize agreement
  – Unique checking constraint

• So, the kid chooses which one to violate (satisfying two) for any given utterance.

Speculations about D-features

• In adult syntax a DP must check its D-feature against both AgrSP and TP.

• AgrSP and TP each have a D-feature of a special sort—the kind that deletes when it is checked (an *uninterpretable* feature)

• Might the UCC be a consequence of kids mistakenly taking the D-feature of DP to be uninterpretable?

NS/OI via UCC

• An old idea about NS languages is that they arise in languages where Infl is “rich” enough to identify the subject.

• Maybe in NS languages, AgrS does not need a D (it may in some sense be nouny enough to say that it *is*, or already *has*, D).

• If AgrS does not need a D, the subject is free to check off T’s D-feature and be done.

Is there any way to see the effects of UCC even in NS languages?

• Italian: *Mary has laughed.*

• Suppose that auxiliaries (like *have*) also have a D-feature to be checked as the subject (in the adult language) passes through. UCC-constrained kids will have to drop something (the auxiliary or T)

• Lyons (1997) reports that a “substantial proportion of auxiliaries are omitted in OI-age Italian.”

Or maybe in Korean negation…

• Short Form Negation in Korean:
  Chelswu-ka pap-ul an-mek-ess-ta.
  Chelswu-nom rice-ace neg-eat-past-decl
  ‘Chelswu didn’t eat rice.’

• Common OI-age kid error:
  na an pap mek-e
  I neg rice eat-decl
  ‘I don’t eat rice.’
Negation errors in child Korean

- Generalization about child errors with SFN: VP-internal material is privileged in its ability to occur between *an* and the verb in child errors.
- Subjects (except subjects of unaccusatives) never appear between *an* and the verb
- Objects often do
- Adverbs often do

One movement down…

- Adults also seem to perform a second movement of the object; the adverb *cal* ‘well’ must immediately precede the verb (unlike other adverbs)—but presumably the object originally (at D-structure) falls between *cal* and the verb. Hence:

  \[ \text{object}_i \ldots \text{cal} \ldots t_i \ \text{verb} \]

Negation errors in child Korean

- Can this error be made to follow from the UCC (you can’t check a D-feature twice)?
- Kid errors seem to involve a structure like:

\[ \text{neg} \ [\ldots \text{VP material}\ldots] \ \text{verb} \]

suggesting that adult negation has a movement that kids are failing to do:

\[ [\ldots \text{VP material}\ldots], \text{neg} \ t_i \ \text{verb} \]

That’s two movements

- So, the object (and some of the VP-internal material) seems to have to move twice in negative sentences, once to get around *cal* (in any kind of sentence), and again to get around *an* (neg).
- That’s what we need to get off the ground if we want to attribute this error to the UCC.

The proposal

- In Korean, the object moves to SpecAgrOP (step one) and checks a D-feature:

\[
\begin{array}{c}
\text{AgrOP} \\
\text{DP}_i \\
\text{AgrO'} \\
\text{AgrO}_{[D]} \\
\text{VP} \\
\text{cal} \\
\text{VP} \\
\text{V} \\
\text{t}_i \\
\end{array}
\]

- Then, AgrOP moves to an AgrNegP above negation, to check a D-feature:

\[
\begin{array}{c}
\text{AgrNegP} \\
\text{AgrOP}_i \\
\text{AgrNeg'} \\
\text{AgrNeg}_{[D]} \\
\text{NegP} \\
\text{an} \\
\text{Neg'} \\
\text{Neg} \\
\ldots t_i \ldots 
\end{array}
\]
The proposal

• The kid can only do one of those movements if it obeys the UCC, since each one requires the same D-feature (contributed by the object).
• So, the kid must either
  – ignore the UCC, or
  – omit AgrOP, or
  – omit AgrNegP

Predictions

• Makes very specific predictions about what we would expect to find:
  • Omit AgrNegP (retaining AgrOP):
    – Object moves (over cal) to SpecAgrOP
    – AgrOP (with cal and object) remain below NegP.
  • an object cal verb

Predictions

• Omit AgrOP (retaining AgrNegP)
  – Object (nearest thing with a D-feature) moves directly to SpecAgrNegP, over an and cal.
  • object an cal verb

Note: This is totally ungrammatical in adult Korean, which requires object cal an verb.

Predictions for unaccusatives

• Unaccusative “subjects” start out in object position, and must presumably move through many more projections (AgrOP, AgrNegP, TP, AgrSP)
• UCC kid can still just do one.
• Only one will yield a non-adult order: keep AgrOP and you get: an subject cal verb.
• Turns out: kids make only about 10% (detectible) errors with unaccusatives (vs. about 30% with transitives). A successful prediction?

Met?

• Sadly, the experiments haven’t been done and the examples haven’t been reported in the literature.
  – We need errors with transitive verbs involving short-form negation and the adverb cal…

So…

• The UCC seems to be pretty successful in explaining why either TP or AgrSP are often omitted for kids in languages like French, German.
• The connection to the NS/OI generalization is reasonable to explain why we don’t seem to see OIs in Italian.
• The more general prediction that the UCC makes about double-movements to check D-features may well be borne out by the facts of Korean negation.
One open question…

- The UCC says you can only use a D-feature on a DP to check against a functional category once.
- This explains why sometimes TP is omitted (keeping AgrSP) and sometimes AgrSP is omitted (keeping TP).
- but if GEN infin. comes from omitting both TP and AgrSP, what could ever cause that (particularly given Minimize Violations)?

Legendre et al. (2000)

- Proposes a system to predict the proportions of the time kids choose the different options among:
  - Omit TP
  - Omit AgrSP
  - Omit both TP and AgrSP
  - Include both TP and AgrSP (violating UCC)

The idea

- Kids are subject to conflicting constraints:
  - Parse-T Include a projection for tense
  - Parse-Agr Include a project for agreement
  - *F Don’t complicate your tree with functional projections
  - *F² Don’t complicate your tree so much as to have two functional projections.

- Sometimes Parse-T beats out *F, and then there’s a TP. Or Parse-Agr beats out *F, and then there’s an AgrP. Or both Parse-T and Parse-Agr beat out *F², and so there’s both a TP and an AgrP.

- But what does sometimes mean?

Floating constraints

- The innovation in Legendre et al. (2000) that gets us off the ground is the idea that as kids re-rank constraints, the position of the constraint in the hierarchy can get somewhat fuzzy, such that two positions can overlap.

  *F

  Parse-T

- When the kid evaluates a form in the constraint system, the position of Parse-T is fixed somewhere in the range—and winds up sometimes outranking, and sometimes outranked by, *F.
Floating constraints

*F
Parse-T

- (Under certain assumptions) this predicts that we would see TP in the structure 50% of the time, and see structures without TP the other 50% of the time.

French kid data

- Looked at 3 French kids from CHILDES
- Broke development into stages based on a modified MLU-type measure based on how long most of their utterances were (2 words, more than 2 words) and how many of the utterances contain verbs.
- Looked at tense and agreement in each of the three stages represented in the data.

French kid data

- Kids start out using 3sg agreement and present tense for practically everything (correct or not).
- We took this to be a “default”
  - (No agreement? Pronounce it as 3sg. No tense? pronounce it as present. Neither? Pronounce it as an infinitive.).

French kid data

- This means if a kid uses 3sg or present tense, we can’t tell if they are really using 3sg (they might be) or if they are not using agreement at all and just pronouncing the default.
- So, we looked at non-present tense forms and non-3sg forms only to avoid the question of the defaults.

French kids data

- We found that tense and agreement develop differently—specifically, in the first stage we looked at, kids were using tense fine, but then in the next stage, they got worse as the agreement improved.
- Middle stage: looks like competition between T and Agr for a single node.

A detail about counting

- We counted non-3sg and non-present verbs.
- In order to see how close kids’ utterances were to adult’s utterances, we need to know how often adults use non-3sg and non-present, and then see how close the kids are to matching that level.
- So, adults use non-present tense around 31% of the time—so when a kid uses 31% non-present tense, we take that to be “100% success”
- In the last stage we looked at, kids were basically right at the “100% success” level for both tense and agreement.
Proportion of non-present and non-3sg verbs

A model to predict the percentages
- Stage 3b (first stage)
  - no agreement
  - about 1/3 NRFs, 2/3 tensed forms

A model to predict the percentages
- Stage 4b (second stage)
  - non-3sg agreement and non-present tense each about 15% (=about 40% agreeing, 50% tensed)
  - about 20% NRFs

A model to predict the percentages
- Stage 4c (third stage)
  - everything appears to have tense and agreement (adult-like levels)
Predicted vs. observed—agr’t

Predicted vs. observed—NRFs

For next time:

- Read Chien & Wexler (1990).
- Write up a 1-2 page summary.
  - What are the primary points?
  - What evidence supports the conclusions?
  - Did you find the evidence convincing?
    If not, why not?