Week 4. 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)

Two hypotheses about learning
- **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.

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).
- Most null subjects are licensed by being the subject of a nonfinite verb (i.e. PRO)
- But there are still 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/pronominal subjects, 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>

*Truncation*

- 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.

V2 and *wh*-null subjects...

- German and Dutch have *extremely few* root infinitives when there is anything in SpecCP.
  - This does go with Rizzi’s prediction...
- 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, Wexler’s prediction seems to be:
- V2 language $\Rightarrow$ no *wh*-question root infinitives
  - And this seems closer to accurate, given English.

*LLEE*

- So: despite expectations of early practitioners of P&P: VEPS means *LLEE.
- What then do we make of the fact that kids make non-adult utterances in the face of evidence that they aren’t *learning* the parameters?
- KW: Certain (very specific, it turns out) properties of the grammar *mature.*

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_{i}
              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

Finite pretty much always goes with a nominative subject.

<table>
<thead>
<tr>
<th>subject</th>
<th>Finite</th>
<th>Nonfinite</th>
<th>Finite</th>
<th>Nonfinite</th>
</tr>
</thead>
<tbody>
<tr>
<td>he/she</td>
<td>255</td>
<td>139</td>
<td>436</td>
<td>75</td>
</tr>
<tr>
<td>him/her</td>
<td>14</td>
<td>20</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>% non-Nom</td>
<td>5%</td>
<td>46%</td>
<td>0.9%</td>
<td>27%</td>
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</table>

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.

Implementing ATOM

- The basic idea: In adult clauses, the subject needs to move both to SpecTP and (then) to SpecAgrP.
- This needs to happen because T “needs” something in its specifier (≈EPP) and so does Agr.
- The subject DP can “solve the problem” for both T and for Agr—for an adult.

<table>
<thead>
<tr>
<th>NS/OI and Hebrew (Rhee &amp; Wexler 1995)</th>
<th>1/2 past/fut (NS)</th>
<th>else (non-NS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>kids up to 1:11</td>
<td>0 (of 6)</td>
<td>0 (of 28)</td>
</tr>
<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>

Implementing ATOM

- Implementation: For adults:
  - T needs a D feature.
  - Agr needs a D feature.
  - The subject, happily, has a D feature.
  - The subject moves to SpecTP, takes care of T’s need for a D feature (the subject “checks” the D feature on T). The T feature loses its need for a D feature, but the subject still has its D feature (the subject is still a DP).
  - The subject moves on, to take care of Agr.

- Implementation: For kids:
  - Everything is the same except that the subject can only solve one problem before quitting. It “loses” its D feature after helping out either T or Agr.
  - Kids are constrained by the Unique Checking Constraint that says subjects (or their D features) can only “check” another feature once.
  - So the kids are in a bind.
Implementing ATOM

- Kids in a pickle: The only options open to the kids are:
  - Leave out TP (keep AgrP, the subject can solve Agr’s problem alone). Result: nonfinite verb, nom case.
  - Leave out AgrP (keep TP, the subject can solve T’s problem alone). Result: nonfinite verb, default case.
  - Violate the UCC (let the subject do both things anyway). Result: finite verb, nom case.
  - No matter which way you slice it, the kids have to do something “wrong”. At that point, they choose randomly (but cf. Legendre et al.)

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.

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.

EPP and missing INFL

- If there were just an IP, responsible for both NOM and tense, then they should go together (cf. “IP grammar” vs. “VP grammar”)
- Yet, there are many cases of root infinitives with NOM subjects
- And, even ACC subjects seem to raise out of the VP over negation (me not go).
- We can understand this once we consider IP to be split into TP and AgrP; tense and case are separated, but even one will still pull the subject up out of VP. (ATOM:+Agr –Tns)

Minimalist terminology

- Features come in two relevant kinds: interpretable and uninterpretable.
- Either kind of feature can be involved in a “checking”—only interpretable features survive.
- The game is to have no uninterpretable features left at the end.
- “T needs a D” means “T has an uninterpretable [D] feature” and the subject (with its normally interpretable [D] feature) comes along and the two features “check”, the interpretable one survives. UCC=D uninterpretable on subjects?
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.
  - Not crazy: *(All) the students (all) have (all) left.*
- UCC-constrained kids will have to drop something (the auxiliary or T), even in Italian.
- Lyons (1997) reports that a “substantial proportion of auxiliaries are omitted in OI-age Italian.”
  - Ok, *maybe.* Consistent, anyway.

**Korean negation?**

- The UCC is about checking D, and that happens not only for subjects but for objects.
- In English objects don’t have to double-check, but are there effects in other languages?
- Hagstrom (2000) looks at errors with negation made by children learning Korean at about the same age that, in other languages, kids are producing root infinitives.
  - Fairly technical and minimalist, but if you survive Wexler 1998, you’re most of the way there.

**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

**Korean negation?**

- Short Form Negation in Korean:
  
  Chelswu-ka pap-ul an-mek-ess-ta.
  Chelswu-nom rice-acc 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**

- 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:
  
  neg […]VP material… ] verb

  suggesting that adult negation has a movement that kids are failing to do:
  
  […VP material…]_i neg  t_i verb

**One movement down…**

- For the UCC to apply, there need to be two movements. Do adults move the object twice?
- 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:
  
  object,... cal ... t_i 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:

\[
\text{AgrOP}
\]

\[
\text{DP}_i \rightarrow \text{AgrO'}
\]

\[
\text{AgrOP}_{[D]} \rightarrow \text{VP}
\]

\[
\text{cal} \rightarrow \text{VP} \rightarrow t_i
\]

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

- 1: Omit AgrNegP (retaining AgrOP):
  - Object moves (over *cal*) to SpecAgrOP. AgrOP (with *cal* and object) remains below NegP.
  - *an object cal verb* (*, non-adult-like)
- 2: Omit AgrOP (retaining AgrNegP)
  - Object (nearest thing with a D-feature) moves directly to SpecAgrNegP, over *an* and *cal*.
  - *object an cal verb* (*, but needs *cal* to be present)
- 3: Violate UCC (keep AgrOP & AgrNegP)
  - *object an cal verb* (adult-like)
- 4: Omit both AgrOP & AgrNegP?
  - *an cal object verb* (*, without *cal* looks like 1)

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*…
  - Possibly fairly easy elicitation experiment that can be done…
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 (of five) 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?

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
  - *F^2 Don’t complicate your tree so much as to have two functional projections.

The idea

- 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 *F^2, 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.*

![Diagram](image)

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.*

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.).

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**

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**Proportion of non-finite root forms**

**A model to predict the percentages**

- Stage 3b (first stage)
  - no agreement
  - about 1/3 NRFs, 2/3 tensed forms
  
  \[
  \begin{align*}
  *F_2 & \quad *F \\
  \text{ParseT} & \quad \text{ParseA}
  \end{align*}
  \]

**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

\[
\begin{align*}
  *F_2 & \quad *F \\
  \text{ParseT} & \quad \text{ParseA}
  \end{align*}
\]
A model to predict the percentages

- Stage 4c (third stage)
- everything appears to have tense and agreement (adult-like levels)

\*P^2 \*F

ParseT ········ ParseA ········

Predicted vs. observed—tense

<table>
<thead>
<tr>
<th>0%</th>
<th>5%</th>
<th>10%</th>
<th>15%</th>
<th>20%</th>
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<tr>
<td>3b</td>
<td>4b</td>
<td>4c</td>
<td>non-present</td>
<td>predicted non-pres</td>
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Predicted vs. observed—agr’t

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</thead>
<tbody>
<tr>
<td>3b</td>
<td>4b</td>
<td>4c</td>
<td>non-3sg</td>
<td>predicted non-3sg</td>
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</table>

Predicted vs. observed—NRFs

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<th>35%</th>
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</thead>
<tbody>
<tr>
<td>3b</td>
<td>4b</td>
<td>4c</td>
<td>NRFs</td>
<td>predicted NRFs</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Various things (homework)

- Is the OT model just proposed a structure-building or full competence model?
- How does the OT model fit in the overall big picture with the ATOM model?

For French, we assumed that NRFs appear when both TP and AgrP are missing. Yet, Schütze & Wexler 1996 claimed the root infinitives appeared with either TP or AgrP were missing.
- Which one is it?
French v. English

- English: T+Agr is pronounced like:
  - /s/ if we have features [3, sg, present]
  - /ed/ if we have the feature [past]
  - /Ø/ otherwise

- French: T+Agr is pronounced like:
  - danser NRF
  - a dansé (3sg) past
  - je danse 1sg (present)
  - j'ai dansé 1sg past

Preparatory comments for next week’s readings

- Borer & Wexler (1987): They are out to challenge the idea that kids start off with the entire grammatical system, in favor of a maturational view of syntactic development.
- Their famous proposal is that children cannot initially construct “A-chains”, and they use evidence primarily from passives.

Passives

- John kicked the ball (active)
- The ball was kicked (by John) (passive)

- Standard analysis: the ball starts off as complement of V in both; in the passive, the agent is suppressed and the verb is deprived of its ability to assign Case. Thus, the ball moves into SpecIP to get Case.
- The ball was kicked t_i.

Intransitives

- The chain between the ball and t created by moving the ball into SpecIP is an A-chain (a chain whose top is in a position where you can only find arguments).

- There are two kinds of intransitive verbs:
  - Unergative
  - Unaccusative (or sometimes “ergative“)

- The unergative verbs have an external argument—just like a transitive verb.

- The unaccusative/ergative verbs have only an internal argument, which moves to subject position—just like in a passive.
Unaccusatives \(\sim\) passives

- An unaccusative is structurally like a passive:
  - The train arrived \(t_i\).
- An unergative is not.
  - The baby giggled.
- So we expect kids to have the same troubles with unaccusatives and passives.

Verbal and adjectival passives

- In English at least, it seems like there are two kinds of words with passive morphology:
  - **Verbal**: The suspect was seen.
  - **Adjectival**: His hair seems combed.
- Borer & Wexler adopt an analysis under which adjectival passives do not involve syntactic movement (lexicon vs. syntax).

Verbal and adjectival passives

- Generally, non-action verbs make poor adjectival passives (while action verbs are fine):
  - *The suspect seems seen. The seen suspect (fled). Seen though the movie was, John went to see it again.
  - The cloth seems torn. The torn cloth (is useless). Torn though the cloth was, John used it anyway.
- Conclusion: It should be possible for kids to say passive-like things as long as they’re adjectival passives.

Babyonyshev et al. (1998)

- They consider two possible reasons why A-chains in passives would not be allowed:
  - Kids can’t build A-chains.
  - Kids can’t “dethematize” the external argument.

UTAH

- The **Uniformity of Theta Assignment Hypothesis** (UTAH) essentially says that the syntactic position in the structure to which any given \(\theta\)-role is assigned does not vary within or across languages.
- So, the patient \(\theta\)-role is *always* assigned to the complement of \(V\) position, for example.

Pesetsky and movement

- Languages can differ in whether they perform overt movement (before SS) or covert movement (after SS, headed to LF).
  - Usual example: Wh-movement (Bulgarian: all \(wh\)-movements overt; English: one overt \(wh\)-movement, the rest covert; Japanese: all \(wh\)-movements covert).
Pesetsky and movement

- If we assume that all languages move all of their wh-words to (Spec)CP by LF (only some languages save some/all of these movements until after SS), then at LF there is always a chain like:
  - Wh-word, ...t,

- One way to think of “covert movement” is as “pronouncing the bottom of the chain” (in a model in which you both interpret and pronounce LF).

Babyonyshev et al. (1998)

- Babyonyshev et al. conduct an experiment with Russian kids to determine whether kids who cannot represent adult unaccusatives (due to the inability to represent A-chains) instead parse them as unergatives.
- “S-homophone”: A different syntactic structure (e.g. an unergative) which sounds like another (e.g. an unaccusative).

Russian genitive of negation

- There is evidence that the genitive argument of an unaccusative remains inside the VP at SS.
- In English, this argument would raise to subject position (SpecIP).
- In Russian, it turns out that there is evidence that the genitive argument raises covertly (between SS and LF) to subject position.

Evidence for covert movement of the genitive argument

- Negative constituents (e.g., any kind of boy) need to co-occur with negation in the same clause.
- Where negative constituents participate in A-chains we can see (e.g., raising), the top of the A-chain has to be in the same clause as negation.
- Genitive negative constituents with raising verbs appear in the lower clause at SS but require negation in the higher clause.
- Conclusion: Genitive arguments move too, creating an A-chain, and the negation requirement is verified at LF.
Testing the idea from Borer & Wexler (1987) that unaccusatives are analyzed as if they are unergatives by kids in the pre-A-chain stage of life.

Turns out that Russian provides a nice test of unaccusativity/unergativity with the “genitive of negation” so we can directly check to see how kids are analyzing their intransitives.