24.949
Language Acquisition

Class 7
Unaccusatives

Last week

- Delay of (certain kinds of?) passives and a controversial proposal

  - ACDH (Borer & Wexler 1987): children cannot carry out A-movement

Universal Phase Requirement (Wexler 2004)

- A refinement/revision of the ACDH

  ‣ *v* defines a phase, whether *v* is defective in adult language or not

  ‣ No EPP feature on unaccusative *v,* even though its phasal for the child

 ‣ **Consequence:** no movement of internal argument out of the unaccusative vP

Predictions

- Both ACDH and UPR make strong predictions that go beyond passives

  ‣ ACDH: all A-movement should be delayed (falsified by movement of external argument to Spec, TP)

  ‣ UPR: all A-movement out from "defective" phases should be delayed

Testing the prediction

- Subject-to-subject raising

(1) a. Bart seems (to Lisa) to be wearing a hat.
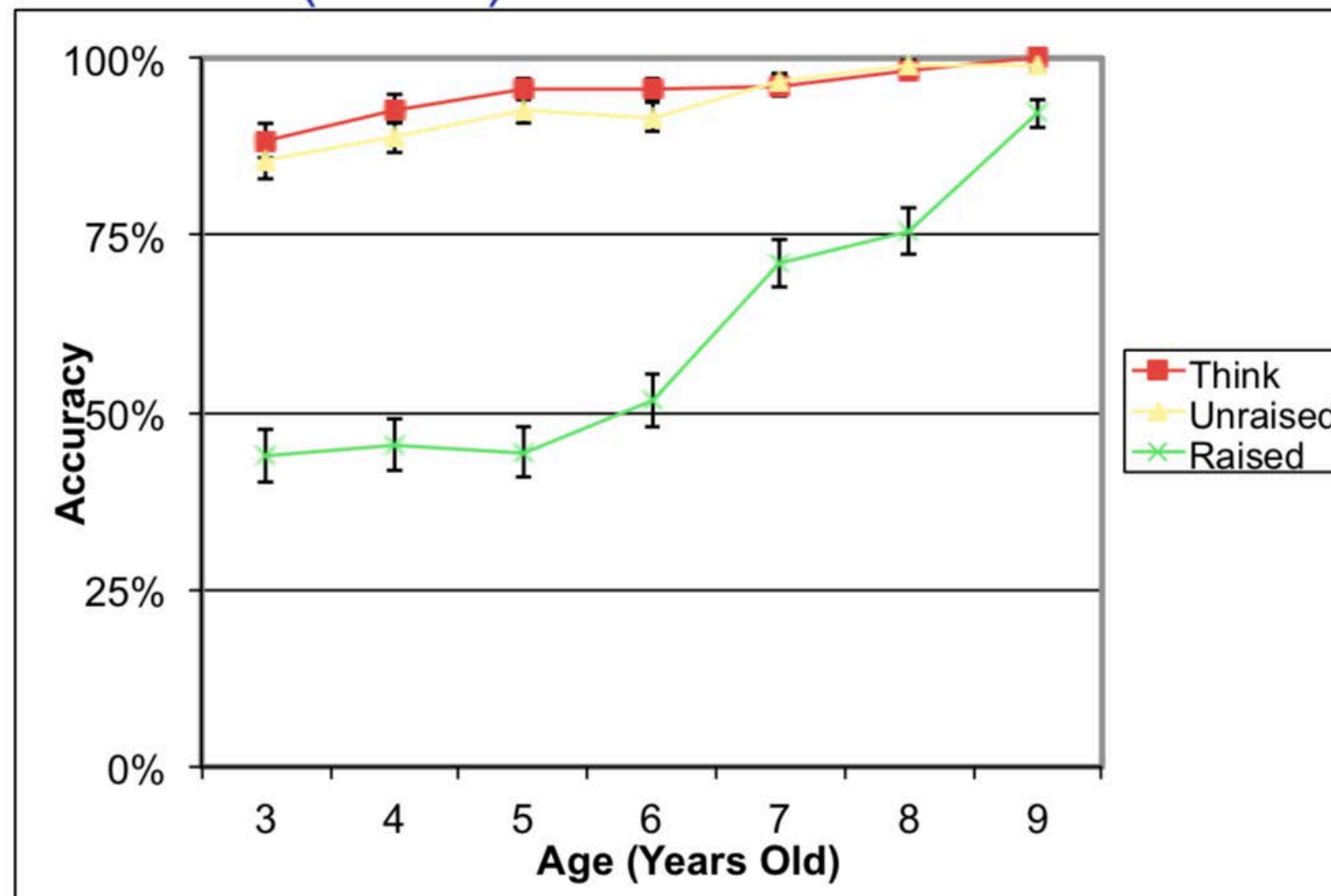b. [$_{TP}$ Bart [$_{vdefP}$ seems (to Lisa) [$_{TP}$ ~~Bart~~ to be [$_{vP}$ ~~Bart~~ wearing a hat]

Acquisition of Raising

- Hirsch & Wexler (2005):
  Picture matching task

  (1) Lisa thinks that Bart is playing an instrument.

  (2) It seems to Lisa that Bart is playing an instrument.

  (3) Bart seems to Lisa to be playing an instrument



A   B

6
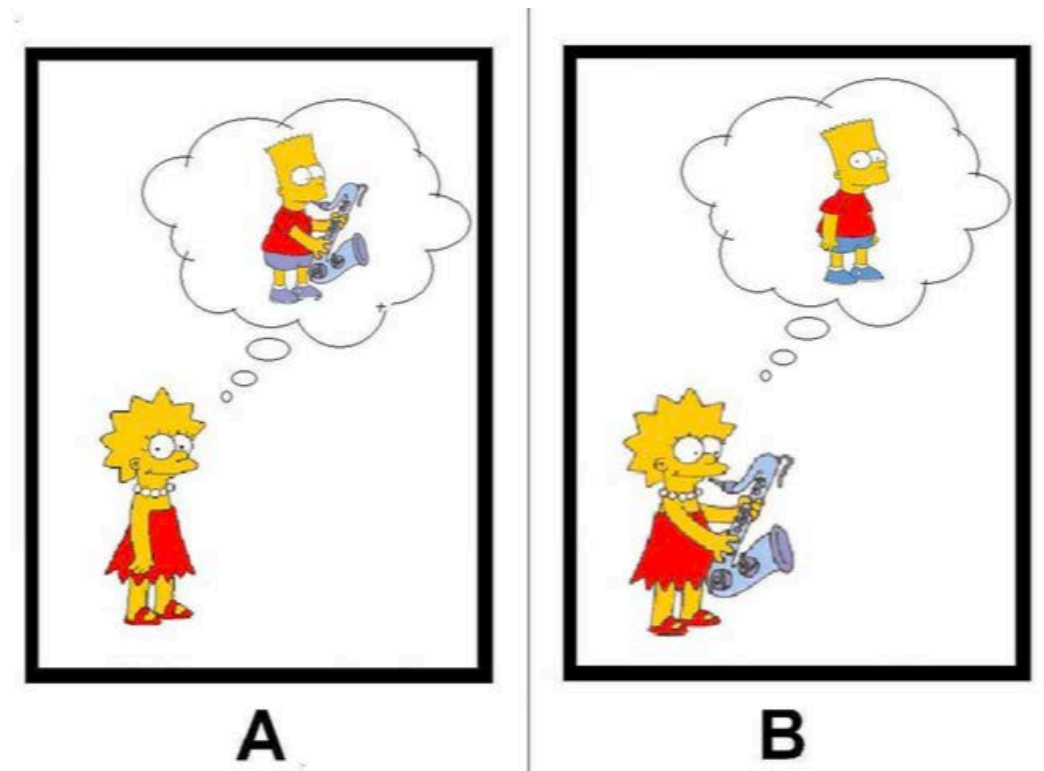
Acquisition of Raising

- Hirsch and Wexler 2005

Replication in Hirsch (2011) with fronted experiencers:
"To Lisa, Bart seemed to be playing an instrument"

Raising vs. passives

- Both raising and passives show similar patterns of development (including early delay).

- Development of raising and passives is highly correlated both within age groups and in individual subjects, suggesting a common linguistic deficit:
r = .78 (scores) ; r = .88 (AC)

Raising vs. Passive Comprehension
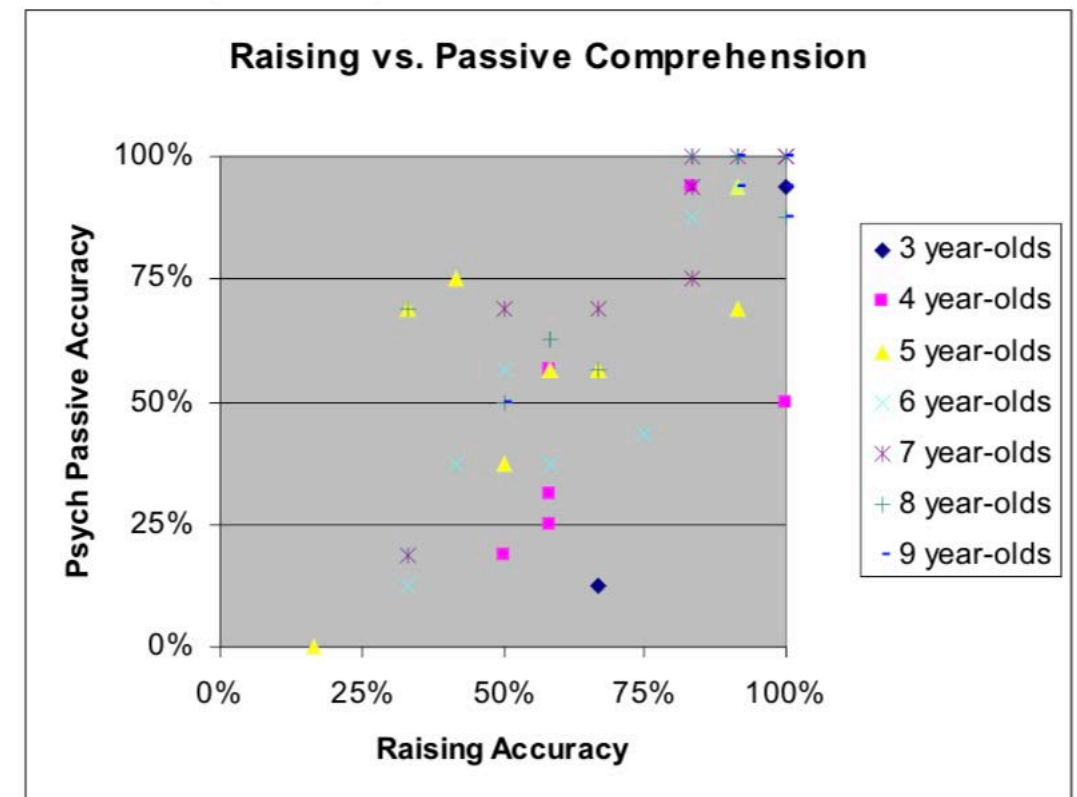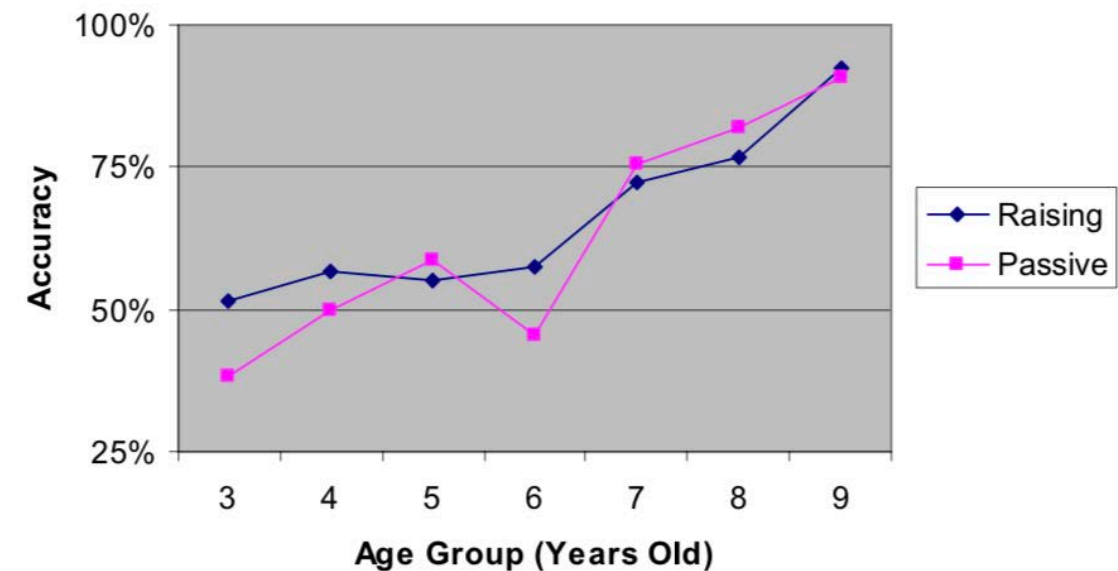
Mono-clausal unaccusatives

(1) The man fell.
[TP the man [vdefP fell ~~the man~~]]]

(2) The man danced.
[TP the man [vP ~~the man~~ [danced]]]

Unaccusatives vs. unergatives

- Evidence for divergent status of the sentential subject in the two strings:

  ▸ properties shared by transitive object and unaccusative subject

    – position (sometimes)

    – genitive-of-negation in Russian

    – possessive datives in Hebrew

  ▸ passivization

  ▸ auxiliary selection

Mono-clausal unaccusatives

- If delay of raising is due to inability to move something out from within the unaccusative *v*, then monocausal unaccusatives should also be delayed.

Acquisition of (mono-clausal) unaccusatives

- Spontaneous production

(1) My teddy bear gone. (Sarah, 2;3)

(2) Marie go. (Sarah, 2;3)

(3) I fall down. (Sarah 2;6)

Acquisition of (mono-clausal) unaccusatives

- Position of sole argument

  ▸ Deprez & Pierce (1993): English-acquiring children produce non-adult post-verbal subjects exclusively with unaccusatives

    (1) Going it (Naomi, 1;10)

    (2) Come car (Eve, 1;6)

    (3) Fall pants. (Nina, 1;11)

  ▸ Friedmann (2007): Hebrew-acquiring children are adult-like in producing both SV and VS orders for unaccusatives, but exclusively SV for unergatives

Acquisition of (mono-clausal) unaccusatives

- Auxiliary selection in Romance

- Adults: *be* aux for unaccusatives, *have* for unergative

Aux selection in Italian
Lorusso (2015)
n=4 children

Table 2. Distribution of Forms with Auxiliaries across Verb Classes in both Children and Adults' Spontaneous Speech

Auxiliary Selection across Verb Classes			
	essere (to be)	*avere* (to have)	Omission
Unaccusatives	66 (95%)	0	4 (5)%
Unergatives	0	6 (67%)	3 (33%)
Transitives	0	158 (68%)	75 (31%)

Aux selection in French
Boyce, Aravind & Hackl (2017)
n=17 children

Table 1: Lexical Productions by Verb Type

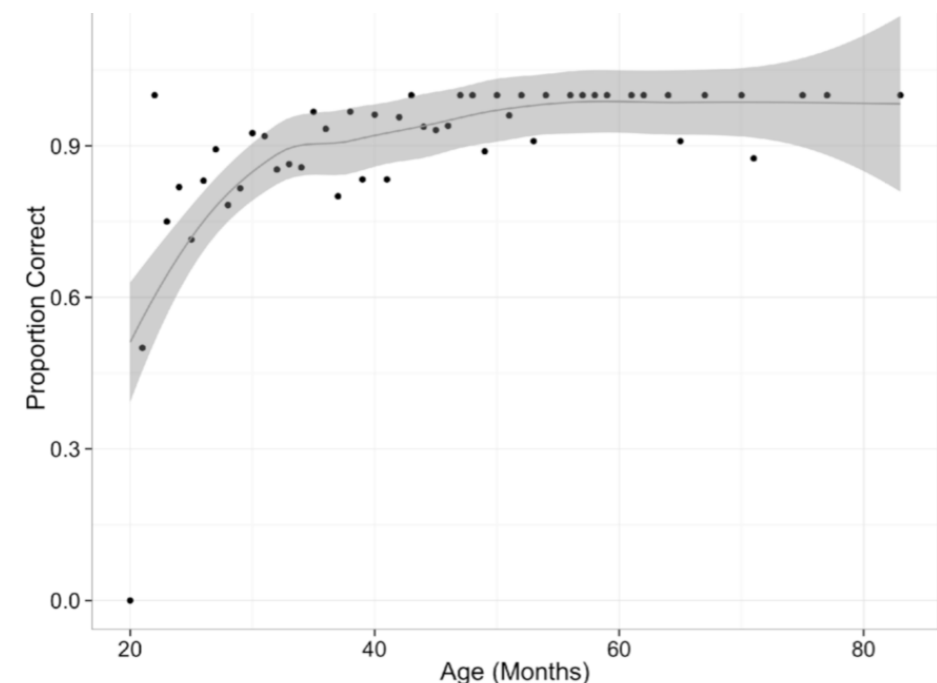| Verb type	Mean Correct (SD)	Productions
Transitives	1(0)	1500+
intransitives (have)	.92(.27)	246
intransitives (be)	.90 (.28)	744

Figure 1: **Proportion of adult-like auxiliary selection for intransitives.**

Conclusions?

- Monoclausal unaccusatives, by various diagnostics, seem to be early

- So either:

  ▸ UPR is wrong

  ▸ UPR is right, but unaccusatives don't involve the illicit sort of movement (cf. Legate 2005)

    – In both cases, need to say something about raising

  ▸ UPR is right, and the production data should not be taken at face value (Babyonyshev et al. approach)

Option 1

- UPR is wrong, something else is going on in the case of raising delay

- **Starting point:** in many languages (e.g. Romance), StSR over an experiencer constitutes a "defective intervention" configuration and is ungrammatical

(1) **Argument Intervention Hypothesis** (Orfitelli 2012 et seq.) Children are delayed with those structures which require A-movement across a structurally intervening argument.

Alternative explanations for the raising delay

- Evidence for AIH:

    - children have asymmetric difficulties with raising *seem* but not *about to* or *going to* (Orfitelli 2012)

    - children have asymmetric difficulties with "opinion *paracer*" but not with "bare *paracer*" in Spanish (Mateu 2017)

Option 2

- ACDH/UPR is on the right track

- Children who produce unaccusatives are assigning to those constructions an unergative syntax

(1) The man fell.
  Adults: [$_{TP}$ the man [$_{vdefP}$ fell ~~the man~~]]]
  Children: [$_{TP}$ the man [$_{vP}$ ~~the man~~ [fell]]]

Babyonyshev et al. 2001

- Diagnostic: Russian genitive-of-negation

  - certain nominal arguments may appear in the genitive case in a negative sentence (semantic criteria like non-specificity)

  - There is a direct-object restriction: the genitive of negation is restricted to underlying direct objects

Babyonyshev et al. 2001

- **Crucial empirical fact:** subjects of unaccusatives behave like objects when it comes to GoN

(1) Ne rasstajalo ni   odnoj   snežinki.
     not melted   NEG single-GEN.SG snowflake-GEN.SG
     'Not a single snowflake melted'

(2) *Nikakix   devoček   ne tancevalo.
     NEG-kind-GEN.PL girl-GEN.PL not danced-NEU.SG
     'No girl danced.'

Babyonyshev et al. 2001

- Optional vs. obligatory GoN predicates:

  ‣ GoN is optional with most unaccusatives; NOM on the single argument is ok

  ‣ With a small subset of common, "bleached" unaccusatives, GoN is obligatory

  (1) Ol'gi Borisovny net.
       Olga Borisovna-GEN isn't

  (2) *Ol'gi Borisovna net.
       Olga Borisovna-NOM isn't

ACDH Predictions

- Like adults, children should:

  - ▸ allow genitive case on the direct object of a negated transitive verb, where semantically appropriate.

  - ▸ disallow genitive case on the subject of an unergative verb, regardless of semantic context.

- Unlike adults, they should:

  - ▸ disallow genitive case on the sole argument of a negated unaccusative verb where an adult would allow genitive case in appropriate semantic contexts.

  - ▸ even disallow genitive case on the sole argument of a negated unaccusative verb from the class of bleached verbs where an adult would require genitive case.

Methods

- 38 3-6.5yos in an elicited production task

- 5 different verb types (3 items per type)
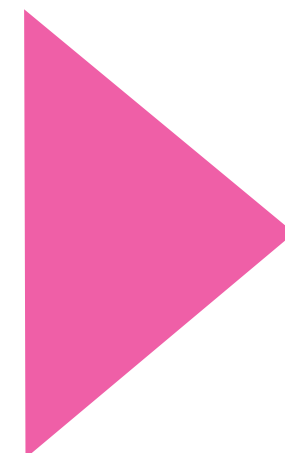
  i)   transitive verb, specific object

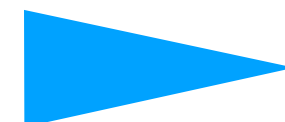 ii) transitive verb, nonspecific object
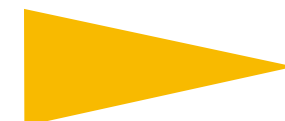
  iii) unergative

  iv) unaccusative

  v)   bleached unaccusative

GoN disallowed

GoN optional

GoN required

Example 1
Nonspecific direct object of a transitive verb with negation

Experimenter [using a toy cat and paper with drawings of houses and bicycles on it]
This is a story about a cat. The cat decides that he wants to paint. So he paints one house — oh, it's difficult! And then he paints another house — it's difficult! He says, ''Now, I'm tired. I can't paint any more,'' and he goes home.

Puppet

Ja	znaju	čto	slučilos'.	Kot	pokrasil	dva	doma	i	ne	pokrasil	ni . . .
I	know	what	happened	cat	painted	two	houses	and	not	painted	NEG

Adult and child

Odnogo	velosipeda.
single-GEN.SG	bicycle-GEN.SG

Example 4
Nonspecific subject of unergative verb

Experimenter [using a toy child, a toy tree, and three toy gnomes]
A boy (or a girl) is walking through a forest. He is very scared of monsters, which he heard live there. Suddenly, he hears someone singing from behind a tree, and becomes really terrified, because now he is sure that it's the monsters singing. He creeps up to the tree and looks around it. He sees that there are three little gnomes singing there, and stops being afraid.

Puppet

Mal'čik	perestal	bojatsja,	potomu čto	uvidel	čto	za	derevom	ne	pe . . .
boy-NOM	stopped-MASC.SG	fear	because	saw-MASC.SG	that	behind	tree	not	s . . .

Adult and child

. . . li	čudovišča.
. . . ang-PL	monster-NOM.PL

Example 3
Nonspecific subject of unaccusative verb

Experimenter [using a toy duck, a toy frog, and a drawing of two houses]
This is a story about a duck, a frog, and two houses. The duck says, ''My house is better.'' Then the frog says, ''No, you're wrong, my house is better.'' The duck says, ''No, my house is better.'' And the frog says, ''No, *my* house is better.'' So they start fighting.

Puppet

Ja	znaju	počemu	ljaguške	bol'še	nravilsja	etot dom.	V etom dome	bylo	okno,
I	know	why	frog	more	liked	this house	in this house	was-NEU	window-NEU,

a	v tom dome	ne	bylo . . .
but	in that house	not	was-NEU

Results

Table 1
Responses in the two transitive and one unergative conditions, collapsed over all children and all trials

Condition	Number of genitive responses out of total responses	Average frequency of genitive responses (SD)
Transitive with nonspecific object	63/84	.73 (.33)
Transitive with specific object	4/83	.04 (.14)
Unergative	0/72	0 (0)

Table 2
Responses in the two unaccusative conditions, collapsed over all children and all trials

Condition	Number of genitive responses out of total responses	Average frequency of genitive responses (SD)
Regular unaccusative	38/81	.45 (.32)
Bleached unaccusative	36/75	.47 (.34)

- Children produced GEN on objects of transitive verbs in the right environments
  ➡ know the requirements of the construction

- Children did not consistently produce GEN on subjects of unaccusatives, even those that required it

Results

- Age by environment interaction effect: older kids are better in the unaccusative environments

Table 3

Average frequency of genitive responses in each condition for each age group (*SD* in parentheses)

	Transitive nonspecific	Transitive specific	Unergative	Regular unaccusative	Bleached unaccusative
Younger (*n* = 15) (mean = 4;0)	.73 (.31)	.04 (.17)	0 (0)	.40 (.33)	.31 (.32)
Older (*n* = 15) (mean = 5;4)	.73 (.36)	.04 (.11)	0 (0)	.50 (.30)	.62 (.30)

Types of children

- Some children did not produce any genitive objects.

- Some children have already matured (producing genitive objects for unaccusatives)

- Obligatory GEN > Optional GEN

- Crucially, no children who did not produce GEN on transitive object, but did produce it on argument of unaccusatives

Table 4
Genitive-of-negation classification by case in each verb category for subjects who provided at least two out of three verbs in each

Subject (sex)	Age	Transitive nonspecific	Transitive specific	Regular unaccusative	Bleached unaccusative	Response classification
01 (F)	3;8	gen	acc*	nom	nom**	a
02 (M)	3;9	gen*	acc*	nom*	nom*	a
03 (F)	4;0	gen	acc	nom	nom	a
04 (F)	4;1	gen	acc	nom	nom	a
05 (F)	4;3	gen	acc	nom	nom	a
06 (M)	4;10	gen	acc	nom	nom	a
07 (F)	5;9	gen	acc	nom	nom*	a
08 (F)	4;1	gen	acc	gen	nom*	b
09 (M)	4;4	gen	acc*	gen	nom	b
10 (M)	5;2	gen	acc	gen	nom	b
11 (F)	4;3	gen	acc	nom	gen	c
12 (M)	4;9	gen	acc	nom	gen	c
13 (F)	5;0	gen	acc	nom	gen	c
14 (F)	5;0	gen	acc	nom	gen	c
15 (M)	5;5	gen	acc	nom	gen	c
16 (F)	5;11	gen	acc	nom	gen	c
17 (F)	6;3	gen	acc*	nom*	gen	c
18 (F)	6;6	gen	acc	nom	gen	c
19 (M)	4;6	gen*	acc	gen	gen**	d
20 (M)	4;7	gen	acc	gen	gen	d
21 (F)	4;7	gen	acc	gen	gen	d
22 (F)	4;8	gen	acc	gen	gen	d
23 (F)	3;0	acc*	acc	nom**	nom**	e
24 (F)	3;6	acc	acc	nom	nom*	e
25 (M)	3;8	acc*	acc*	nom*	nom*	e
26 (F)	4;2	acc*	acc*	nom**	nom*	e
27 (F)	5;0	acc	acc	nom	nom	e
28 (F)	6;2	acc	acc	nom	nom	e
29 (F)	4;2	gen	gen	gen	nom	f
30 (M)	4;8	acc*	acc*	gen**	nom*	g

Interpretation

- The authors take their data as providing support for the ACDH, but…

   "Their data did indicate a difference between the way children treated the internal argument of a transitive, and the internal argument of an unaccusative, but if I understood correctly, that is not enough for ACDH to be true – ACDH claims that children's unaccusatives have an unergative syntax. Given this, the difference in behaviour between unergatives and unaccusatives in Babyonshev et al's experiment is unexplained in the ACDH analysis."

Friedmann 2007

- A series of sentence repetition experiments with 2-4-yos

- Assumption: children can only repeat back a structure if they command the syntactic structure

Friedmann 2007

- Baseline experiment (Exp 2)

etmol   nigmera ha-uga
yesterday finished the-cake

etmol   ha-xalav nigmar
yesterday the-milk finished

etmol   lavsha ha-yalda sveder
yesterday wore   the-girl sweater

etmol   ha-safta   ciyra praxim
yesterday the-grandma drew flowers

TABLE 2
Repetition Performance in the Various Sentence Types: % Correct (Correct/Total)

Age	Unaccusative VS	Unaccusative SV	Transitive VSO	Transitive SVO
2;3–2;8	82% (49/60)	92% (55/60)		
2;11–3;4	100% (60/60)	97% (58/60)	30% (18/60)	93% (56/60)
3;6–3;10	100% (60/60)	100% (60/60)	43% (26/60)	98% (59/60)

not all movement easy to repeat!

Friedmann 2007

- Possessive dative constructions

  ‣ A diagnostic, which, like Russian GoN, picks out underlying internal arguments: possessive datives can only modify internal arguments.

  ‣ Hence, possessive datives can serve as possessors to objects of transitive verbs, and also, crucially, to subjects of unaccusatives, but not to subjects of unergatives

Friedmann 2007

S-V-PPdative unaccusatives with possessive dative
ha-dubi   nafal l-a-yalda
the-teddy-bear fell   to-the-girl

A-S-V-PP unaccusatives with PP adjuncts
etmol   ha-kos   nishbera b-a-kiyor
yesterday the-glass broke   in-the-sink

A-V-S-PP unaccusatives with PP adjuncts
etmol   nishpax ha-mic   al-ha-ricpa
yesterday spilled   the-juice on-the-floor

A-S-V-O transitives
etmol   ha-doda kanta   simla
yesterday the-aunt bought dress

A-V-S-O transitives with verb movement
etmol   kar'a ha-safta   sefer
yesterday read   the-grandma book

TABLE 3
Correct Repetition Percentages for Each Sentence Type

Age	Unaccusative SVPosDative	Unaccusative AVSP	Unaccusative ASVP	Transitive AVSO	Transitive ASVO
2;0–3;0	82%	46%	65%	18%	77%
3;4–4;0	88%	71%	77%	39%	88%

Reconciling the findings

- How do we reconcile these findings?

  ‣ over-estimation using repetition task? (missing an ungrammatical unergative control)

  ‣ under-estimation using elicited production?

- Is there a way we can figure out the underlying structure in the first place?

Online processing of unaccusatives

- **Probe recognition task:** people are faster in recognizing a probe related to the argument of an unaccusative verb after the sentence than of an unergative verb (Bever and Sanz, 1997)

Online processing of unaccusatives

- **Cross Modal Lexical Priming:** Adults distinguish on-line between unaccusative and unergative verbs (Friedmann et al. 2007)

  (1) The landlord(1) of the building on Lexington Boulevard suddenly **jumped**/**fell**(2) when the newly(3) signed lease flew away in the light evening breeze

     + a Lexical decision task

     – **Related probe:** rent
     – **Unrelated probe:** pond

- **Result:** participants are faster in making the lexical decision for related probes at pp(3) if the verb is unaccusative

Online processing of unaccusatives

- Koring et al. (2012): adults distinguish between unaccusatives and unergatives in a visual world paradigm

Koring et al. 2012

- The task: "looking while listening"

  - participants hear a sentence while looking at a visual scene and their eye-movements are measured using an eye-tracker

Koring et al. 2012

- **Key assumption 1:** visual fixations reflect sentence processing

- Not just looking at images related to lexical items; more directly tied to the propositional content being communicated
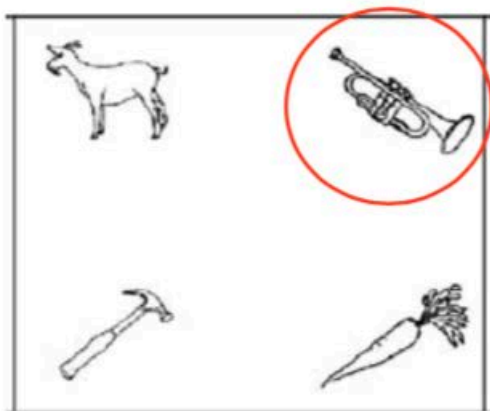
'Eventually, the man agreed hesitantly, but then he looked at the **piano** and appreciated that it was beautiful'.

(Yee and Sedivy, 2006; Huettig and Altmann, 2005)
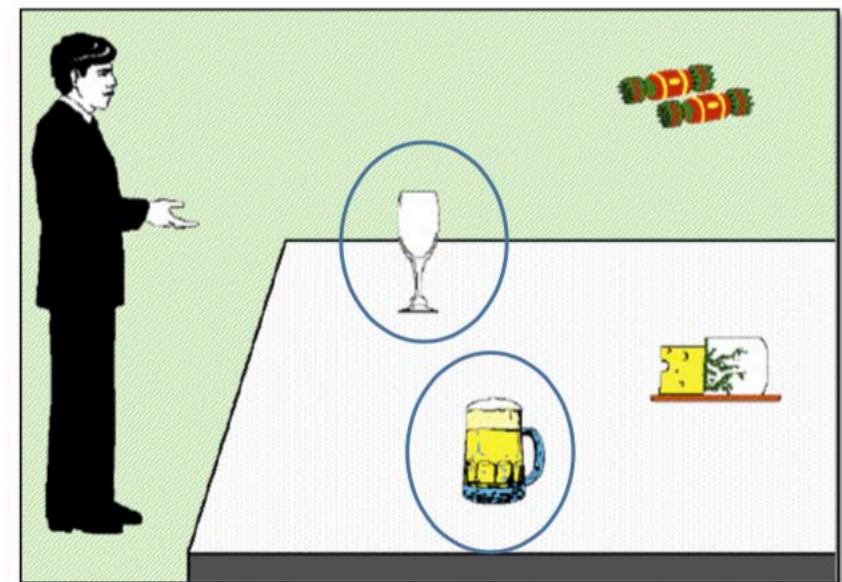
'the man will drink all of . . .' or 'the man has drunk all of . . .'

(Altmann & Kamide, 2007)

Koring et al. 2012

- **Key assumption 2:** traces/copies of movement are "reactivated" during processing, resulting in increased looks to target

Dickey et al. (2007)

One day a bride and a groom were walking in the mall.
The bride was feeling playful, so the bride tickled the groom.
A clerk was amused.

a. Who (1) did the bride tickle (2) today in the mall?
b. Point to who (1) he bride was tickling (2) in the mall.
c. Point to who (1) was tickled (2) by the bride in the mall.

Increased looks to <u>groom</u> at location (2) in (a) and (b), but not (c)

Koring et al. 2012

- 37 Dutch adults in a VWP

- 3 types of verbs:

  i)   unaccusatives (non-alternating; *fell*)

  ii) theme-unergatives ("mixed"; *sparkle*)

  iii) agent-unergatives (*dance*)

Koring et al. 2012
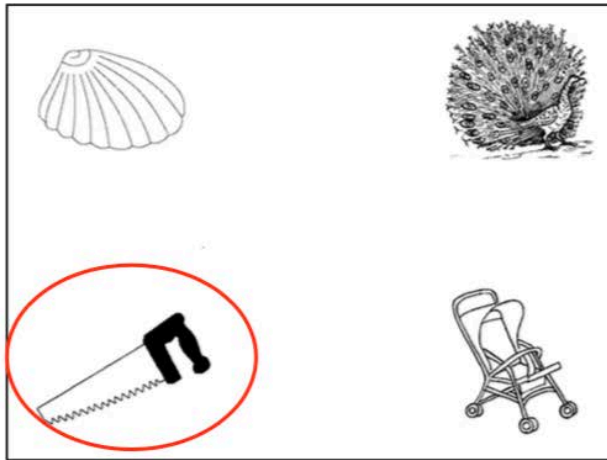
Test sentence:
Bert said that **the wood** (argument) of the fat gentleman with the bald head **fell** (V) hard after the heavy thunderstorm had begun with a flash
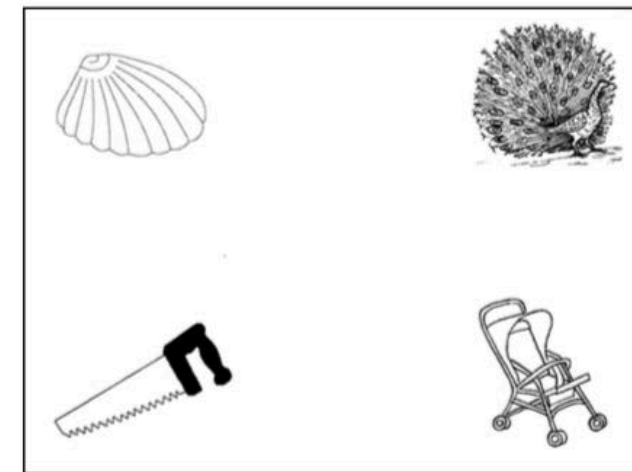
Control sentence:
Bert said that **the clock** (argument) of the fat gentleman with the bald head **fell** (V) hard after the heavy thunderstorm had begun with a flash

DV = Difference score in looks to target
= looks to target in test - looks to target in control
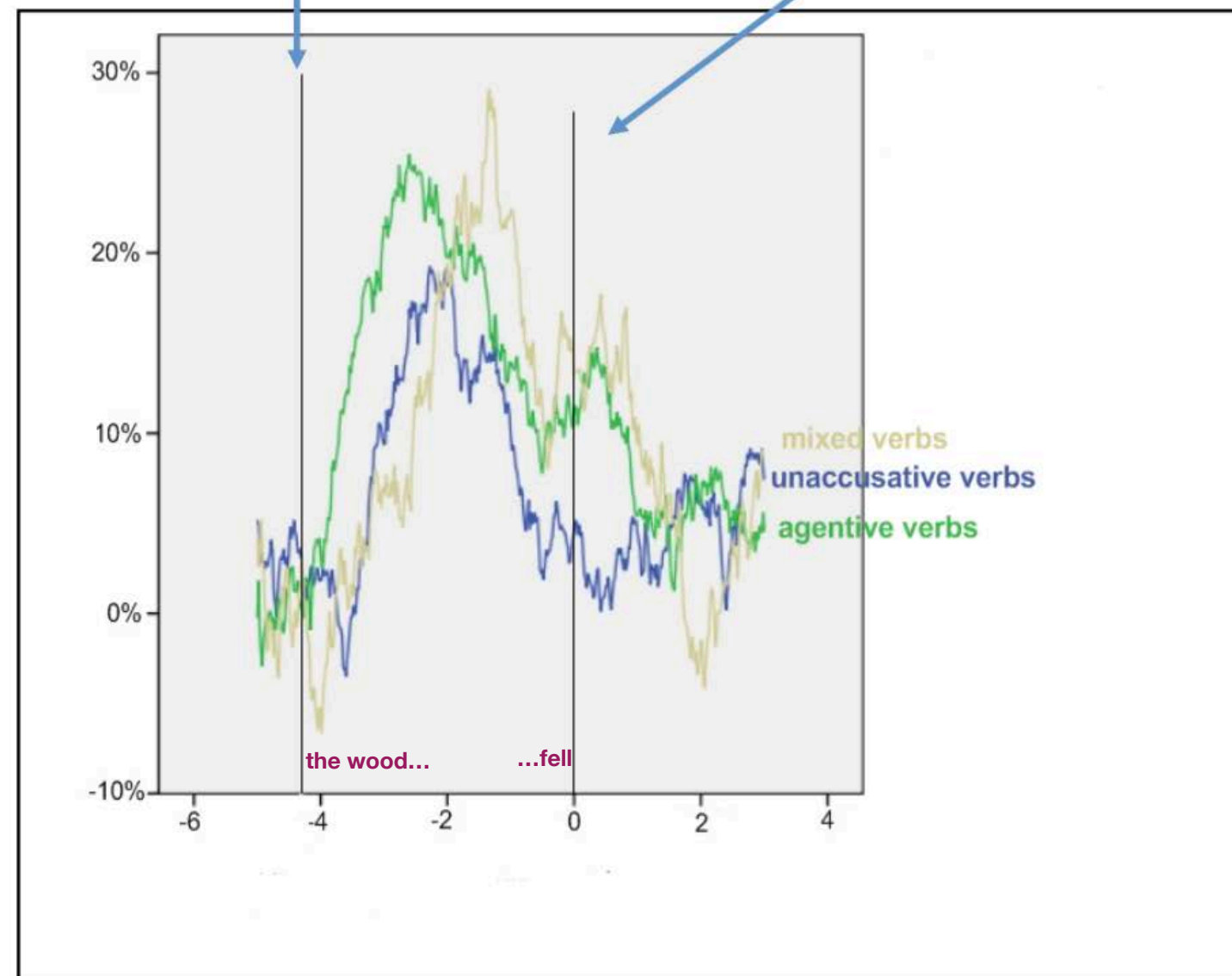
Koring et al. 2012

Koring et al. 2012

- 2 analysis frames

  ‣ **verb frame:** 600 ms before verb offset until 1000 ms after verb offset

  ‣ **post-verb frame:** 200 ms until 1700 ms after verb offset

- **Growth-curve analysis:** what is analyzed is not total proportion of looks in the relevant frame, but change in shape of curves in those frames

Koring et al. 2012

- Verb frame

  ‣ agent-unergatives and theme-unergatives pattern together: rise-fall pattern

  ‣ unaccusatives pattern differently: fall-rise

- **Interpretation:** increase in looks to target in unergatives due to "early reactivation" of external argument
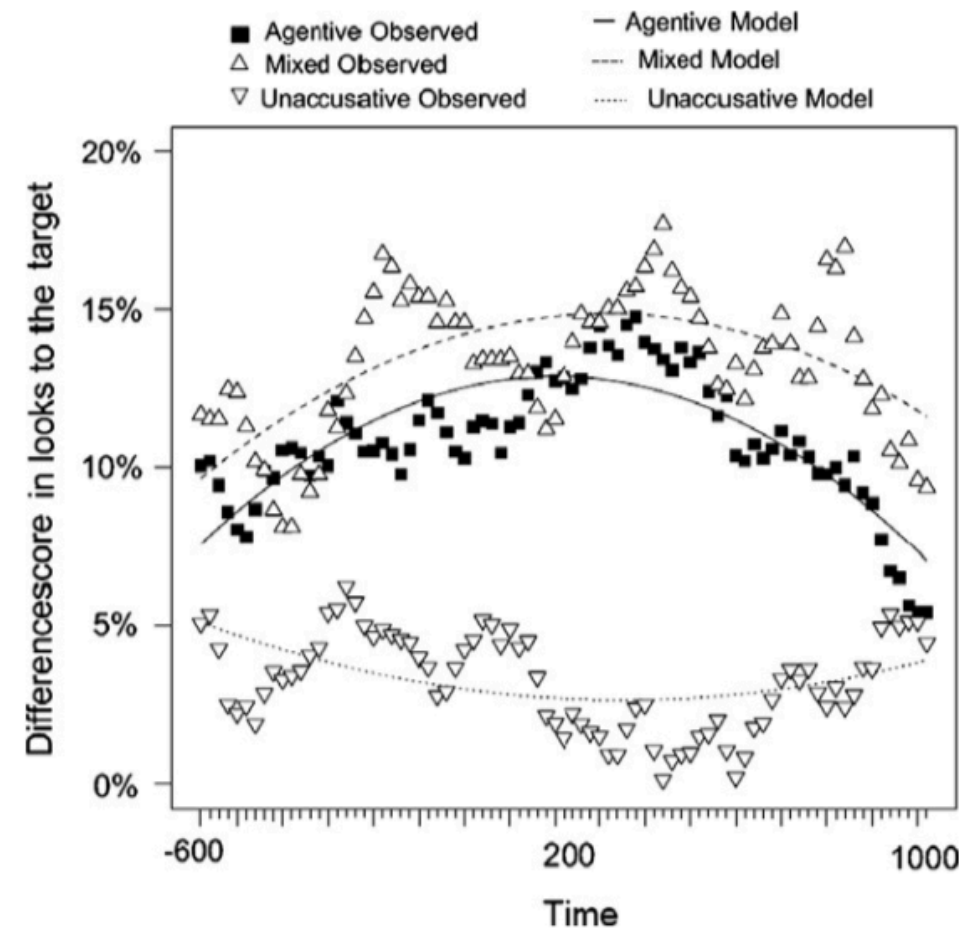
Fig. 3. Mean percentage of looks to the target in the three conditions zoomed in on the verb frame (600 ms before verb offset until 1000 ms after verb offset). Proportions are proportions of looks to the target in sentences with a related argument minus proportions of looks to the target in sentences with a control argument (baseline). The curves are synchronized to the acoustic offset of the verb. Hence, 0 s is verb offset.

Koring et al. 2012

- Post-verb frame

  - ▸ unaccusatives show a late-rise pattern that sets them apart from the unergatives

- **Interpretation:** "late reactivation" of what is underlyingly the internal argument
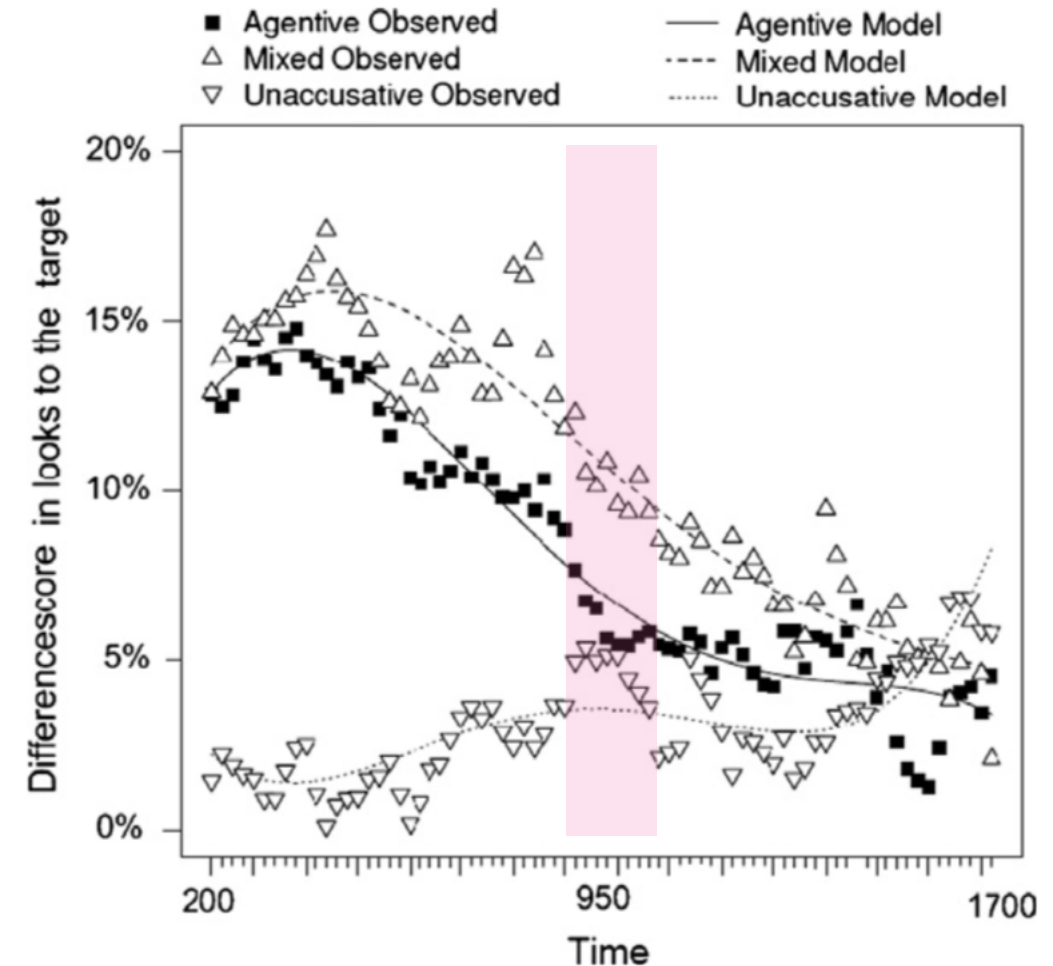
Fig. 4. Mean percentage of looks to the target in the three conditions zoomed in on the post-verb frame (200 ms until 1700 ms after verb offset). Proportions are proportions of looks to the target in sentences with a *related* argument minus proportions of looks to the target in sentences with a *control* argument (baseline). The curves are synchronized to the acoustic offset of the verb. Hence, 0 s is verb offset.

Koring et al. 2017

- Adult data from Koring et al. 2012 signals a difference in processing signature related to the syntactic position of the sole argument

- If children show this signature, we might reason that they are not assigning to unaccusatives an unergative syntax
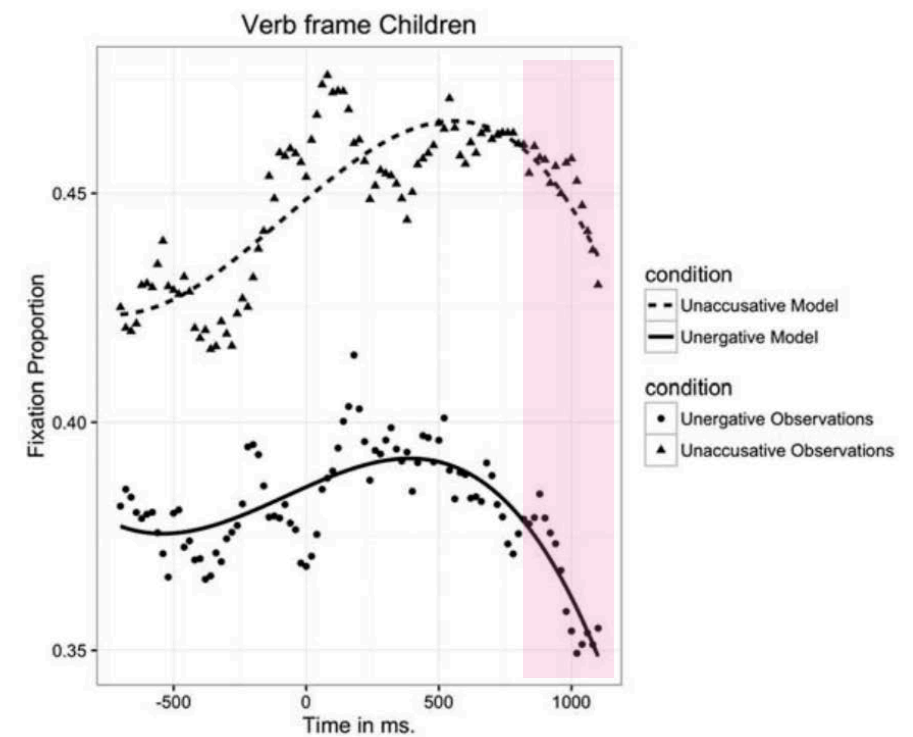
Koring et al. 2017

- 58 5-to-7-yo Dutch-acquiring children

- 30 adult controls

- Two verb types: unaccusatives + agent-unergatives

Koring et al. 2017
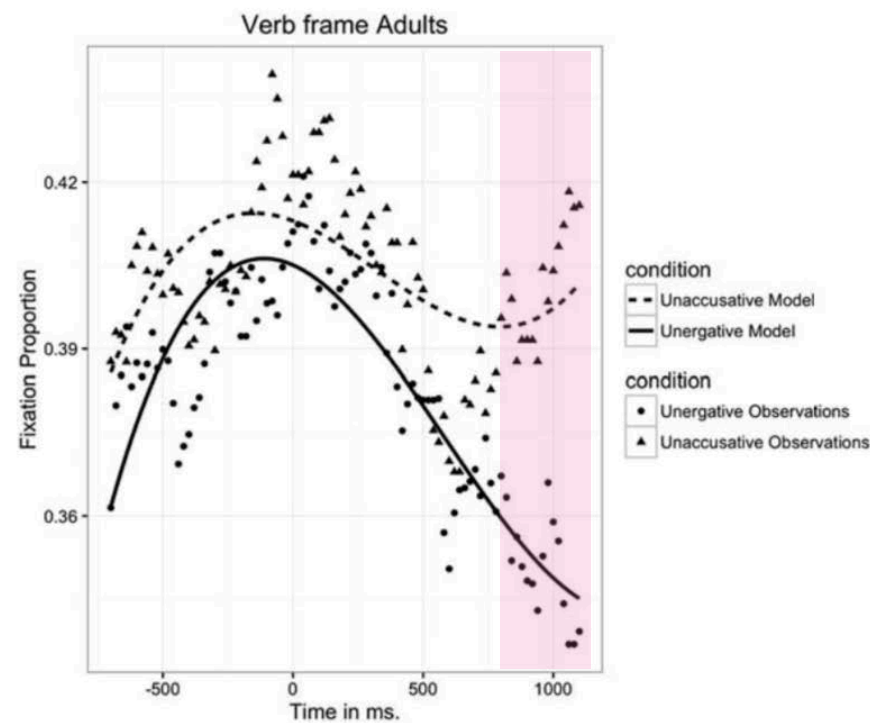
Figure 3. Mean percentage of looks to the target for adults in the verb frame (700 msec before verb offset until 1,100 msec after verb offset). The curves are synchronized to the acoustic offset of the verb. Hence, 0 sec is verb offset.
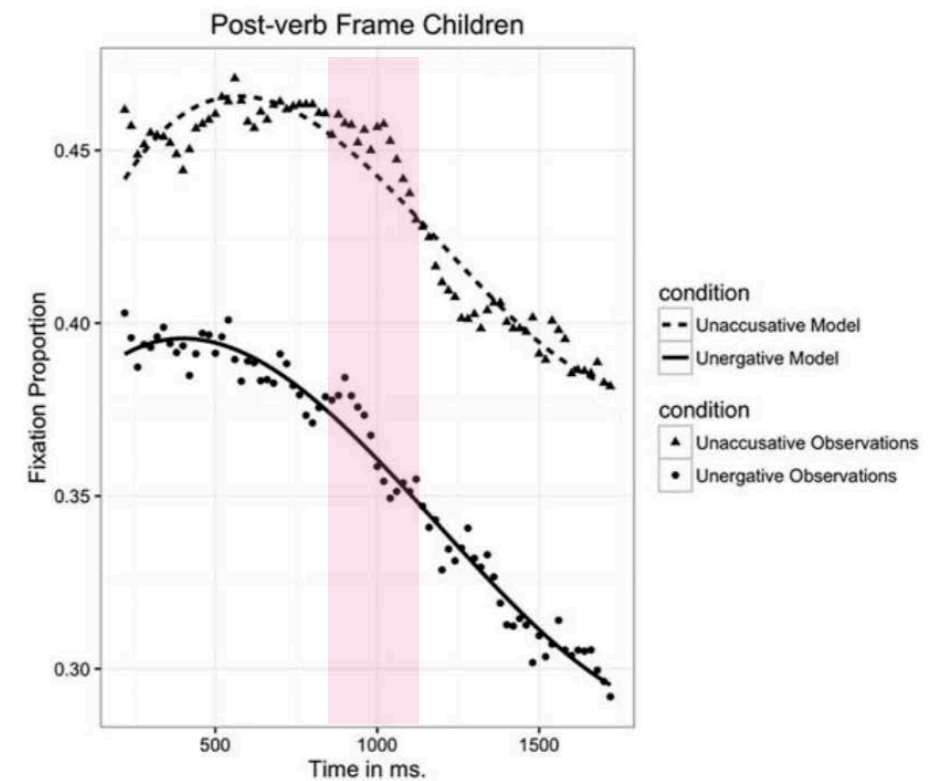
Figure 4. Mean percentage of looks to the target for children in the verb frame (700 msec before verb offset until 1,100 msec after verb offset). The curves are synchronized to the acoustic offset of the verb. Hence, 0 sec is verb offset.

Koring et al. 2017
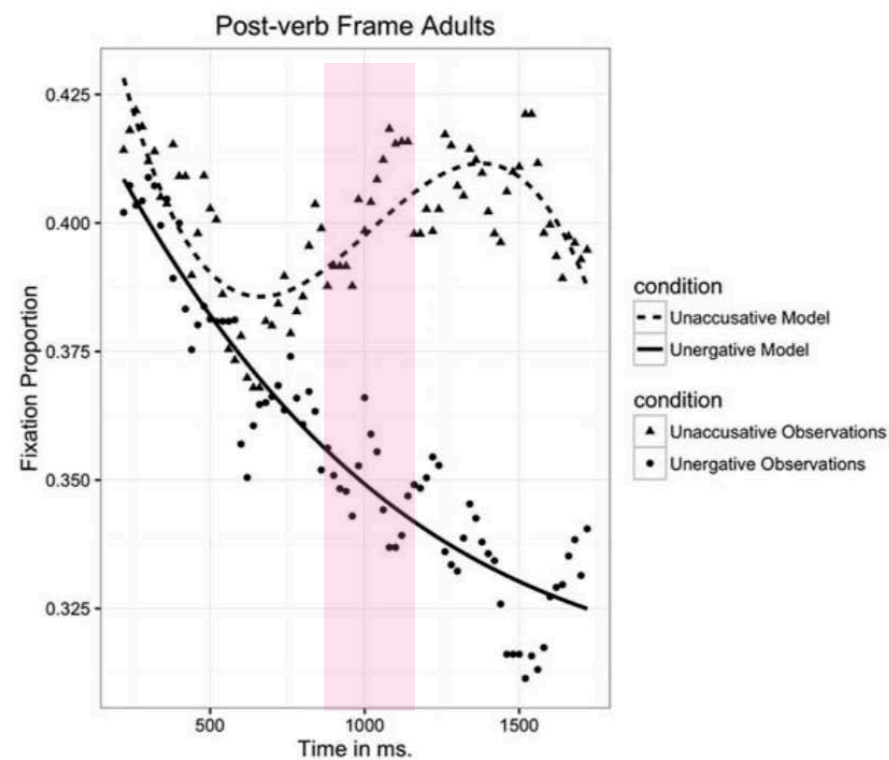
Figure 5. Mean percentage of looks to the target for adults in the post-verb frame (200 msec after verb offset until 1,700 msec after verb offset). The curves are synchronized to the acoustic offset of the verb. Hence, 0 sec is verb offset.

Figure 6. Mean percentage of looks to the target for children in the post-verb frame (200 msec after verb offset until 1,700 msec after verb offset). The curves are synchronized to the acoustic offset of the verb. Hence, 0 sec is verb offset.

Koring et al. 2017

- Adults display a activation-deactivation-reactivation pattern for unaccusatives

- Children display a sustained activation pattern from verb-onset

- Possible interpretations:

    ‣ Unergative-misanalysis hypothesis is right

    ‣ A processing difficulty: initially hypothesize an active/causative *v* and have difficulties revising

Next time

- onto *wh*-questions, readings TBA