

Composing associated motion in Santiago Laxopa Zapotec*

Jack Duff – UC Santa Cruz – jduff@ucsc.edu

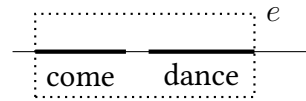
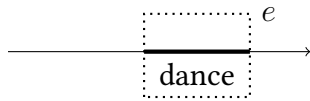
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Santiago Laxopa Zapotec¹ (SLZ, Oto-Manguean) can refer to sequences of a subject’s Motion and a subsequent intended Goal event with a single, morphologically-complex predicate (1b).

(1) Associated motion (VENITIVE) in SLZ:

a. B-ya’a Xwanha’.
PERF-dance Juana.
“Juana danced.”

b. B-de-ya’a Xwanha’.
PERF-VEN-dance Juana
“Juana **came and** danced.”



Label from recent typological literature: ASSOCIATED MOTION (AM) (Guillaume & Koch, 2021a).

- Well-attested outside Europe, particularly in the Americas.
- SLZ’s system is typologically unmarked, a good entry point.

In SLZ, three key properties:

- Ⓐ Event Composition Ⓑ Argument Identification Ⓒ Intentional Subjects

Studying AM allows us to learn more about the productivity and limits on the event composition available in a single clause.

In this talk:

- §1: Lay out the key meaning components of AM in SLZ
- §2: Explore whether a plan-based approach can capture intentionality effectively
- §3: Develop an explicit compositional semantics for AM
- §4: Demonstrate how the proposal can generalize to other attested AM systems

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¹SLZ is a Northern Zapotec language spoken by at least 1200 speakers in Santiago Laxopa, a municipality in the Ixtlán district of Oaxaca’s Sierra Norte. Well-studied neighbors include Zoogocho (Long C. & Butler H., 2000; Sonnenschein, 2004) and Zochina Zapotec (Lopez Nicolas, 2009, 2016), and it has been studied together with the Zapotec of speakers from the nearby towns of Yalina and Guiloxi as “Sierra Zapotec” (Adler et al., 2018; Toosarvandani, 2020, a.o.). The data here comes from about 30 weekly elicitation with one speaker living in Santa Cruz.

1 Key data

SLZ is VSO, and the two AM prefixes occur amidst other prefixal morphology on the verb.

- (2) a. **VENITIVE *de-* (towards speaker)** b. **ANDATIVE *ja-* (not towards speaker)**
B-**de**-do Bedw'nh xche'. Ø-**ja**-do Bedw'nh xche'.
PERF-**VEN**-eat Pedro dinner. PERF-**AND**-eat Pedro dinner.
'Pedro came and ate dinner.' 'Pedro went and ate dinner.'

Crucially monoclausal: negation, aspect-marking, agreement, causative derivation and aspectual adverbials can only occur once. See Appendix 1 for more evidence for monoclausality via binding.

1.1 Event structure

1.1.1 Two sub-events

AM entails the realization of two events in sequence:

- A **Motion** event (specified by prefix)
- A **Goal** event (specified by verb)

(3) **AM entails a Motion event.**

B-de-daw =e' xche', # perw bitu b-id =e'.
PERF-**VEN**-eat =he dinner but NEG PERF-**COME** =he
"He came and ate dinner, but he didn't come." (Contr.) (SLZ5034-105)

(4) **AM entails a Goal event.**

- a. B-de-do Maziare'nh xche'. # Bitu u-daw =e'.
PERF-**VEN**-eat NAME dinner NEG PERF-**EAT** =he
"Maziar came and ate dinner. He didn't eat." (Contr.) (SLZ5034-110)
- b. Ja-yep Bedw'nh ya'ado'. # Bitu u-zulho =ba'.
PERF.**AND**-climb Pedro mountain NEG PERF-**START** =he
"Pedro went and climbed a mountain. He didn't start." (Contr.) (SLZ5052-021)

These entailments don't project from under negation: I conclude they are not presupposed.

(5) **Neither event projects.**

- a. Context: Pedro ate dinner at home, hasn't come to the speaker's house.
Bitu b-de-do Bedw'nh xche'.
NEG PERF-**VEN**-eat Pedro dinner
"Pedro didn't come eat dinner." (SLZ5062-004)
- b. Context: Pedro came to the speaker's house to eat lunch, hasn't eaten dinner.
Bitu b-de-do Bedw'nh xche'.
NEG PERF-**VEN**-eat Pedro dinner
"Pedro didn't come eat dinner." (SLZ5062-002)

1.1.2 Loosely composed into one

Aspect like PERFECTIVE applies to the entire sequence as if it were simplex.

(6) **Unlike IMPF, PERF entails culmination in simple forms.**

a. **Dzo** Bedw'nh xwe. Bitu b-iyuhzh u-do =ba'.
IMPF.eat Pedro lunch NEG PERF-finish PERF-eat =he

“Pedro was eating lunch. He didn't finish eating.”

(SLZ5047-021)

b. **U-do** Bedw'nh xwe. # Bitu b-iyuhzh u-do =ba'.
PERF-eat Pedro lunch NEG PERF-finish PERF-eat =he

“Pedro ate lunch. He didn't finish eating.” (Contr.)

(SLZ5047-019)

(7) **PERF also entails culmination of the whole sequence in AM.**

B-de-do Bedw'nh xwe. # Bitu b-iyuhzh u-do =ba'.
PERF-VEN-eat Pedro lunch NEG PERF-finish PERF-eat =he

“Pedro came and ate lunch. He didn't finish eating.” (Contr.)

(SLZ5047-040)

The Goal need not directly follow Motion, though it must occur within Motion's result state.

(8) **AM permits intervening time, events.**

Context: Juana arrived in Laxopa, slept, and danced at a fiesta on the next day.

B-de-ya'a Xwanha' Laxup.
PERF-VEN-dance Juana Laxopa.

“Juana came and danced in Laxopa.”

(SLZ5063-010)

The right relationship seems to be enablement (Wolff, 2003; Altshuler, 2016): Motion enables Goal.

Ⓐ **Event Composition:**

AM composes a complex event from a loose sequence of Motion and Goal.

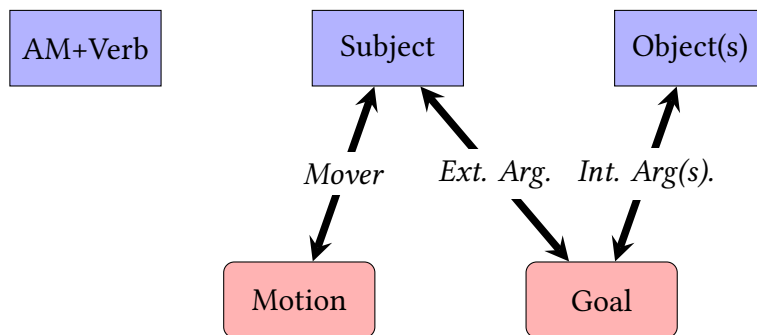
1.2 Argument structure

1.2.1 Argument identification

The subject of an AM complex is obligatorily interpreted as both:

- the external argument of the Goal
- the mover in the preceding Motion event

(9) The argument structure of AM sentences



Ⓑ Argument Identification:

AM preserves the argument structure of the Goal and identifies its external argument with the external argument of Motion.

1.2.2 Additional subject entailments

But the obligations on the subject are more than those imposed by Motion and Goal.

Even when a predicate typically permits a non-sentient (10a) or unintentional (11a) subject, the corresponding AM complex requires a subject who is sentient (10b) and intentional (11b).

(10) **No non-sentient subjects in AM.**

a. Be-s-bizh wizh =e'nh beku' =nh.
PERF-CAUS-dry sun =the dog =the
“The sun dried off the dog.” (SLZ5050-034)

b. # B-de-s-bizh wizh =e'nh beku' =nh.
PERF-VEN-CAUS-dry sun =the dog =the
Int: “The sun came and dried off the dog.” (SLZ5050-043)
Comment: “Only as a metaphor or dream.”

(11) **No unintentional subjects in AM.**

a. B-xixe Xwanha'. Bitu b-enh =de =ba' =nh
PERF-sneeze Juana NEG COMP-do =on.purpose =she =it
“Juana sneezed. She didn't do it on purpose.” (SLZ5072)

b. B-de-xixe Xwanha'. # Bitu b-enh =de =ba' =nh.
PERF-VEN-sneeze Juana NEG COMP-do =on.purpose =she =it
“Juana came and sneezed. She didn't do it on purpose.” (Contr.) (SLZ5072)

© **Intentional Subjects:**

AM complexes require a sentient subject that intends to bring about the Goal.

1.3 Interim summary

Three key characteristics:

- Ⓐ Event Composition
- Ⓑ Argument Identification
- Ⓒ Intentional Subjects

We also observe Ⓑ Argument Identification and Ⓒ Intentional Subjects in familiar Motion + Infinitive constructions, which are biclausal in SLZ (Appendix 1).

- (12) U-yej =ba' we-chib yiche'e lege =ba'nh.
PERF-go =he INF-cut hair =his
'He went to cut his hair.' (SLZ5069-034)

Nevertheless, we won't use an analysis of M+Inf as a starting point here.

- Naively, M+Inf would seem to derive intention from some form of modality in the Goal.
- If we have a modal Goal here, we have to do extra work to get the Goal to still be entailed.

2 Some complex events require plans

To start: What does AM mean?

- (A) Event Composition: two non-contiguous events are seen as one meta-event
- (C) Intentional Subjects: there are extra entailments placed on the subject

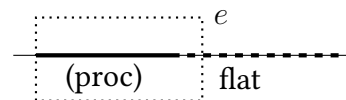
Two questions towards a principled semantics:

- Q1. What consequences does (A) have for theories of single-clause event structure?
 Q2. Do (A) & (C) co-occur for any principled reason?

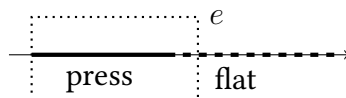
Familiar approach to event composition: complex events can only realize roughly the same maximal template, an externally-caused process along with its result.

- simple Vendlerian (1967) accomplishments (13)
- English resultatives (14) (Rappaport Hovav & Levin, 1998; Levin, 2020)
- morphological causatives (Harley, 2008; Ramchand, 2008; Pylkkänen, 2008)
- consequence: process + result as a limit in semantics (e.g. Rappaport Hovav & Levin, 1998) or syntax (e.g. Borer, 2005)?

(13) Marta squashed the can.



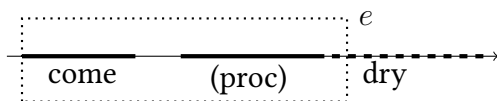
(14) Marta pressed the can flat.



But AM makes it clear that this isn't the limit: accomplishments and causatives can be embedded.

(15) B-de-s-bill Bedw'nh beku' =nh.
 COMP-VEN-CAUS-dry Pedro dog =the
 "Pedro came and dried off the dog."

(SLZ5050-041)



I cannot offer a new or revised version of an explanatory theory, but I'll present one apparent limit a full account should capture: certain complex events can only be represented if planned.

2.1 Plans in the grammar

What progress can we make on intention using the notion of a plan?

- Plan for e = mental state held by a director; if successful, causes e
- If a plan for e caused e , e occurred intentionally
- Part of event structure rather than a thematic relation

Plan entailments are visible in the grammar in English futurates and *have*-causatives (Copley, 2008, 2014, 2018; Copley & Harley, 2009, cf. Dowty, 1979).

- (16) **Futurates and have-causatives.**
- The Red Sox play the Yankees tomorrow.
 - Obama had Clinton travel to France last Tuesday.
- (17) **Unplannable events are infelicitous.**
- # The Red Sox beat the Yankees tomorrow.
 - # Obama had it rain last Tuesday.
- (18) **Plans are states: They have temporal traces.**
- Yesterday, John was getting married right now.
 - In 1999, the DNC had the primaries start with Iowa in 2000.

In the *have*-causatives, the subject is the director (plan-holder), entails intention and sentience.

- (19) **Copley's (2018) account of *have*-causatives, with liberties**
 $\llbracket \text{have } Y P \rrbracket \rightsquigarrow \lambda x_e \lambda s_s. \text{PLAN}(s, x) \wedge \text{CAUSE}(s, e) \wedge P'(e, Y)$

2.2 Plans for AM

If AM entails a plan for the sequence with the matrix subject as the director, we could capture:

- subject is intentionally involved
- sub-events are united within intention

- (20) $\llbracket \text{VEN-} \rrbracket \rightsquigarrow \lambda P_{\langle e, st \rangle} \lambda x_e \lambda e_s. \exists e_1, e_2 \sqsubset e [\text{ENABLE}(e_1, e_2) \wedge \text{come}'(e_1, x) \wedge P(e_2, x)] \wedge$
 $\underline{\exists s [\text{PLAN}(s, x) \wedge \text{CAUSE}(s, e)]}$

Two relevant points of variation from other uses of plans:

- Plan's state variable is existentially closed, not available for modification (true in SLZ)
- Mandates a plan, whereas Copley (2018) uses a broader class of dispositions: difference in grammaticalization?

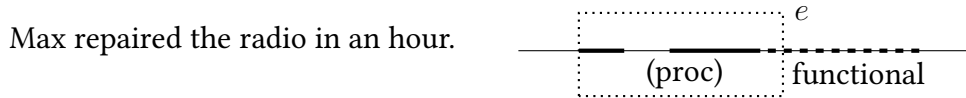
2.3 When plans are obligatory

There's a larger class of situations where plans seem to mandatory in event descriptions which aren't contiguous in time or force.

- E.g. in English, plan entailments are required for event descriptions which admit **gaps**, sub- eventualities within the runtime which do not realize or advance the event description.

(21) **Tovena (2011): Non-incremental accomplishments permit gaps.**

Context: Max fiddled around with a broken radio for 15 minutes, sat still for 15 minutes, and then worked with his hands actively on the device for 30 more minutes and succeeded.



(22) **Non-incremental accomplishments require plans.**

Context: Unobserved, a monkey came upon a broken radio, fiddled around with the device without purpose for 15 minutes, after which the radio started functioning.

The monkey repaired the radio.

- The same applies to cases where activities are coerced to accomplishments via a runtime which includes a preceding gap (Moens & Steedman, 1988; Copley & Harley, 2015).

Intuitively, plans seem to be a way for an event description to hang together even if it does not mandate temporal coherence.

Though there is interesting work to be done on the right way to derive this relationship (see Copley & Harley, 2015), we will be content with the generalization, formalized below.

- (23) **EVENT FILTER:** For a prejacent P to Asp, if P admits events e with a gap (a subeventuality which does not instantiate or contribute to P), then $P(e)$ must entail the existence of a plan to bring about e .

$$\forall e \left(P(e) \wedge \exists e' [e' \sqsubset e \wedge \neg \text{STAGE}(e', e)] \right) \left[\exists s, d [\text{PLAN}(s, d) \wedge \text{CAUSE}(s, e)] \right]$$

(See also Wolff, 2003 and discussion in Truswell, 2011.)

Under this view, plans license particular kinds of event complexity.

AM in SLZ would need a plan for the same reason *repair* does: its event description permits gaps.

3 Compositional proposal

So far:

- proposed an analysis for (C) Intentional Subject based on plans
- explored whether plans are connected to event complexity more broadly

What remains:

- a compositional account that captures (A) Event Composition and (B) Argument Identification

The tack: picking up ingredients from proposals for more familiar structures.

3.1 Composing the complex event

Certain morphological causatives also compose a complex event from a preadjacent sub-event.

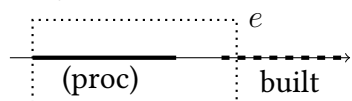
- Hindi-Urdu *-vaa* (Bhatt & Embick, [2003] 2017; Ramchand, 2008; Bhatia, 2016)
- Japanese productive *-sase* (Harley, 2008; Pytkäinen, 2008)
- Similar looseness of sequencing (‘indirect’)

(24) Anjum-ne makaan ban-vaa-yaa.

Anjum-ERG house be.made-*vaa*-PERF.M.SG

“Anjum had a house built.”

(Butt, 2003, cited in Ramchand, 2008)



We can borrow the basic shape of Ramchand’s (2008) semantics for *-vaa*:

- Affix as a modifier of event predicates
- Existentially binds sub-event e_2 which satisfies preadjacent P
- Introduces and existentially binds an initial sub-event e_1
- Projects a complex event e which contains e_1 and e_2

(25) $\llbracket \text{VEN-} \rrbracket \rightsquigarrow \lambda P_{\langle e, st \rangle} \lambda x_e \lambda e_s. \exists e_1, e_2 \sqsubset e [\text{ENABLE}(e_1, e_2) \wedge \text{come}'(e_1, x) \wedge P(e_2, x)] \wedge \exists s [\text{PLAN}(s, x) \wedge \text{CAUSE}(s, e)]$

But, causatives typically introduce a new argument instead of displaying argument identification, so we need another ingredient.

3.2 Argument identification

The sub-event introduced by AM shares an argument with the prejacent.

We can account for this using approaches to infinitival clauses with no surface subject.

- Road not taken: standard “syntactic” control (e.g. Landau, 2000), see Appendix 1.
- Road taken: Wurmbrand’s (2002) “semantic control” (cf. Montague, 1973; Chierchia, 1984)
 - Two verb-like elements, only one (high) subject
 - Prejacent is a property, slot for subject unfilled
 - Lexical semantics of first verb passes subject down

(26) **A quasi-Montagovian restructuring verb imposing semantic control**

$$\llbracket \text{try}_M \rrbracket \rightsquigarrow \lambda P_{\langle e, st \rangle} \lambda x_e \lambda e_s. \text{try}'(e, x) \wedge \Box_x P(e', x)$$

(where \Box_x is restricted to worlds where x succeeds)

(27) $\llbracket \text{VEN-} \rrbracket \rightsquigarrow \lambda P_{\langle e, st \rangle} \lambda x_e \lambda e_s. \exists e_1, e_2 \sqsubset e \left[\text{ENABLE}(e_1, e_2) \wedge \underline{\text{come}'(e_1, x) \wedge P(e_2, x)} \right] \wedge \exists s \left[\text{PLAN}(s, x) \wedge \text{CAUSE}(s, e) \right]$

This requires us to allow a verbal projection to:

- semantically introduce its external argument
- without syntactically selecting for its external argument

This can be achieved by splitting vP (Pylkkänen, 2008; Harley, 2017).

	License int. arg.	Introduce ext. arg.	Merge ext. arg. in Spec
(28) VoiceP	-	-	✓
vP	✓	✓	-

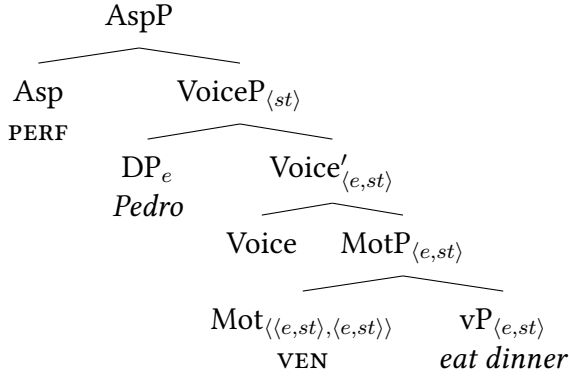
Two points of evidence in Hiaki (Uto-Aztecan; Harley, 2013; 2017):

- transitive and passive morphemes are distinct and can co-occur
- high applicatives require agentivity but can be bound by external argument

3.3 Example derivation

I locate AM as a Mot head between vP and VoiceP.

(29) A proposed composition for (2)



The semantics for the prefix contains all the properties already discussed.

(30) A sample derivation

- a. $\llbracket \text{VEN-} \rrbracket \rightsquigarrow \lambda P_{\langle e,st \rangle} \lambda x_e \lambda e_s. \exists e_1, e_2 \sqsubset e [\text{ENABLE}(e_1, e_2) \wedge \text{come}'(e_1, x) \wedge P(e_2, x)] \wedge \exists s [\text{PLAN}(s, x) \wedge \text{CAUSE}(s, e)]$
- b. $\llbracket \text{eat dinner} \rrbracket \rightsquigarrow \lambda x_e \lambda e_s. \text{eat}'(e) \wedge \text{Th}(e) = \text{DINNER} \wedge \text{Ag}(e) = x$
- c. $\llbracket \text{VEN-eat dinner} \rrbracket \rightsquigarrow \lambda x_e \lambda e_s. \exists e_1, e_2 \sqsubset e [\text{ENABLE}(e_1, e_2) \wedge \text{come}'(e_1, x) \wedge \text{eat}'(e_2) \wedge \text{Th}(e_2) = \text{DINNER} \wedge \text{Ag}(e_2) = x] \wedge \exists s [\text{CAUSE}(s, e) \wedge \text{PLAN}(s, x)]$
- d. $\llbracket \text{Pedro VEN-eat dinner} \rrbracket \rightsquigarrow \lambda e_s. \exists e_1, e_2 \sqsubset e [\text{ENABLE}(e_1, e_2) \wedge \text{come}'(e_1, \text{PEDRO}) \wedge \text{eat}'(e_2) \wedge \text{Th}(e_2) = \text{DINNER} \wedge \text{Ag}(e_2) = \text{PEDRO}] \wedge \exists s [\text{CAUSE}(s, e) \wedge \text{PLAN}(s, \text{PEDRO})]$

4 The bigger picture

I've given an account of the meaning and composition of AM, which derives one of its key properties—(C) Intentional Subjects—from the claim that plans license particularly complex event descriptions.

The other compositional facts—(A) Event Composition & (B) Argument Identification—can be accounted for by combining ingredients from better-studied constructions.

$$(31) \quad \textcircled{A} \textcircled{B} \textcircled{C} \\ \llbracket \text{VEN-} \rrbracket \rightsquigarrow \lambda P_{(e, st)} \lambda x_e \lambda e_s. \exists e_1, e_2 \sqsubset e \left[\text{ENABLE}(e_1, e_2) \wedge \text{come}'(e_1, x) \wedge P(e_2, x) \right] \wedge \\ \exists s \left[\text{PLAN}(s, x) \wedge \text{CAUSE}(s, e) \right]$$

4.1 Allowing for variation

Two pieces of AM's meaning in SLZ are simply stipulated here in the lexical entry:

- The temporal order of Motion and the prejaacent event
- Identification of external arguments

This may be right, because these properties vary in the AM typology (Guillaume & Koch, 2021b).

E.g.: Northern Sahaptin (Sahaptian; NW US), $w\varepsilon\text{'}$ - (Dryer, 2021, citing Jacobs 1931)

(32) **AM can be less constrained.**

a. **Subject Motion prior to prejaacent**

$i\text{-}w\varepsilon\text{'}\text{-}wi\text{-}cabni\text{-}ya$

3SG-MOT-many-ask-PAST

“He went and asked many people.”

b. **Subject Motion subsequent to prejaacent**

$i\text{-}w\varepsilon\text{'}\text{-}wina\text{'}\text{-}utp\text{-}a$

3SG-MOT-hurriedly-dress-PAST

“He dressed hurriedly and went.”

c. **Object Motion concurrent with prejaacent**

$i\text{-}w\varepsilon\text{'}\text{-}t\text{'}\text{-}lqw\text{əd}\text{-}na$

3SG-MOT-catch-PAST

“He caught it as it went.”

(N. Sahaptin: Jacobs, 1931, p. 149)

Nevertheless, SLZ-type AM is very common, which can be explained by lexicalization pressures.

- Prior AM is most common, harmonic with prelinguistic salience of goals in directed motion events (Lakusta & Landau, 2012; Lakusta & Carey, 2015)
- Subject movers are most common, harmonic with general tendencies for subject control (Landau, 2000), subject agentivity (Dowty, 1991), and subject prominence.

4.2 No intention, no gaps?

The entertained Event Filter can generate a biconditional prediction:

- All AM that requires intentional subjects will permit gaps
- Any AM that can occur with unintentional subjects won't permit gaps

One point in favor from a distinct Zapotec language: San Lucas Quiaviní Zapotec does allow unintentional AM, but indeed does not appear to permit gaps (Anderson, 2019).

- (33) Z-ied-cha zhyet ni =a per queity r-acbedi =ëng ca-cha =ëng ni =a.
PROG-VEN-warm cat feet =my but NEG HAB-know =it PROG-warm =it foot =my
“The cat is coming and warming my feet but it doesn't know that it warms my feet.”
(SLQ Zapotec: Anderson, 2019, p. 16)

Overall, the account seems to make the right typological predictions for AM.

Towards further insights:

- Wider study of AM can bring a whole body of new evidence for our theories of event structure to account for.
- If AM is possible, what other meta-events are?
- If this complexity is unique to motion sequences, why?

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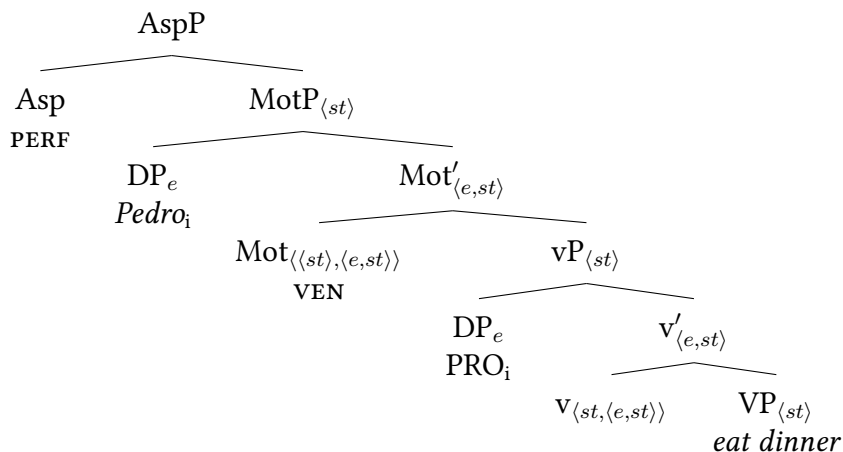
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A Alternative: Syntactic control?

Why not just use syntactic control?

- No need to split vP
- Two syntactic subject positions
- Lower subject is a controlled PRO

(34) An alternative composition for (2) using syntactic control



Binding evidence reveals that the surface subject is local to the internal arguments of the Goal.

Zapotec “backwards binding” allows implicit subjects when co-indexed with an object’s possessor (Black, 1996; Foreman, 2006).

(35) “Backwards binding” licenses implicit subject from possessor

Chinə yichj =a’.

FUT.comb head =my

“I will comb my hair.”

(Yatzachi Zapotec: Butler, 1976)

Some locality restrictions observed: no BB with MPI.

(36) Backwards binding blocked out of infinitives

B-ide *(=ba’) we-chib yiche’e lege =ba’nh.

PERF-come =he INF-CAUS.bare hair head =his

“He_i came to cut his_i hair.”

(SLZ5069-039)

Proposal: Blocked by PIC (Chomsky, 1999), infinitives don’t contain a C but do contain an external argument position (PRO).

But AM is just fine.

(37) **Backwards binding permitted in AM**

B-de-chib (=ba') yiche'e lege =ba'nh.

PERF-VEN-CAUS.bare =he hair head =his

"He_i came and cut his_i hair."

Conclusion: The AM preadjacent lacks a subject position and thus a phase boundary.

This rules out syntactic control, in favor of AM composing below the external argument position.