From pluractionality to aspect

Gunnar Lund

Lund (2021)

I investigated the connection between pluractionality and progressive aspect in English and Balinese.

I developed a story involving a modular architecture of discrete pluractional, progressive, and dispositional operators in a neo-Davidsonian framework.

The pathway from iterativity to imperfective aspect

Bybee, Perkins, and Pagliuca 1994

Iterative > Continuative > Progressive

> Imperfective

Iterative > Frequentive > Habitual

Hittite *-ske/a-*

- Has iterative, progressive/continuative, habitual/frequentive, and possibly generic imperfective functions (Ingelese & Mattiola 2020).
- Inherited from IE **-sk'e/o-*, which is diachronically related to imperfective exponents in, e.g., Greek and Indo-Iranian. It's debatable what it's core IE function was, but iterativity is one candidate (Ingelese & Mattiola, Willi 2018).
- There's argument as to whether it fully grammaticized as an aspectual category or remains in the domain of lexical aspect as a pluractional marker (Josephson 2008, Ingelese & Mattiola 2020).
- Ingelese & Mattiola (2020) argue that progressive/habitual functions are developments in Hittite from an IE pluractional.

Iterative

nu	LÚA.ZU	***ḫukki-ški-zzi***
conn	physician	invoke-ipfv-prs.3sg

‘(Then gold-spear-man holds a plated spear, and a physician holds a sistrum. They march together), and the ‘physician’ repeats the invocations’

Frequentive

namma	ÉRIN.MEŠ-*an*	MU-*ti*	MU-*ti*	***pi-ška-nzi***
then	troop:acc	year:dat	year:dat	give-ipfv-prs.3sg

‘And they will keep providing troops year after year’

Continuative/Progressive

takku	LÚ-*aš*	GU$_4$=*ŠU*	ÍD-*an*	***zī-nu-ški-zzi***
if	man:nom	ox=3sg.poss	river:acc	cross-caus-ipfv-prs.3sg

tamaiš=an	*šu*[*wezzi*]
other:nom=3sg.acc	push:prs.3sg

‘If a man is making his ox cross a river, and another man pushes him off (the ox’s tail)’

Habitual

karū	1	MA.NA	KÙ.BABBAR	***pi-šk-er***	*kinuna*
formerly	1	mine	silver	give-ipfv-pst.3pl	now
20 GÍN	KÙ.BABBAR	*pāi*			
20 shekel	silver	give:prs.3sg			

‘Before they used to give 1 mine of silver, now he gives 20 shekels of silver’

But I found that the empirical foundation of this pathway was less definitive than we'd like.

Bybee, Perkins, and Pagliuca 1994

Based on the following data:

	Total	Partial
Iterative	6	2
Continuative	2	1
Frequentive	1	2
Progressive	1	4
Habitual	0	4

Methodological questions

This pathway hasn’t been heavily scrutinized as far as I can tell, and there are some problems with it.

- Small sample of languages/exponents.
- Total reduplication is not the origin point of all reduplicative morphemes, though it is for many (Hurch & Mattes 2009).
- Completely typological, no “true” historical data points.
- Terminology inconsistent across sources.

Fixed vowel reduplication

Niepokuj (1997):

“[A] strong developmental tendency exists in one direction only: toward fixed vowel reduplication. . . . In most or all of the cases examined in which both vowel-copying and fixed-vowel reduplication exist in the same language or in the same language family, the evidence points to the vowel-copy reduplication being older and the fixed-vowel reduplication being younger.” (1997, p. 41)

Austronesian

Reid (2009) argues that fixed vowel reduplication, *Ca-*, diachronically develops from *CV-* reduplication.

Zeitoun & Wu's (2006) typological study of the Formosan family finds that *Ca-* reduplication has repetitive, continuous, progressive, and stativizing functions, while *CV-* reduplication has only repetitive and continuous functions.

Ca-: *k<m>iskis* 'press down' > *k<m>a-kiskis* 'keep pressing down'

CV-: *mu-tusi* 'go' > *mu-tu-tusi* 'go often'.

Mattiola (2020)

- Survey of 246 languages, where 179 had at least one pluractional marker
- 2 markers had progressive functions (in addition to continuous & event internal functions)
- Markers with continuous and iterative functions always have event-internal functions (47 cases).
- Markers with generic functions also have frequentive and habitual functions (15 cases)
- Markers with iterative and habitual functions always have frequentive functions (52 cases).

So the typology of pluractional constructions seems to be important, but terminological issues still abound.

The goal: bring clarity to the pathway using formal semantics.

We’ll redefine the change using some formal notions, and hopefully end up with a better idea of what to look out for.

We’ll start with a theory of the progressive that has two crucial components: one that is concerned with internal composition of an event, and another that introduces the relation between the event and a reference time.

The first part ties us to iterativity.

The second part ties us to aspect.

The progressive and cross-temporal identity (Landman 2008)

The essential idea is that an event can be a unified whole even when its parts are temporally disconnected.

This is readily seen in activity events.

biking

biking

“Siobhan is riding her bike.”

biking

biking

NOW

We need a model of the progressive that allows the sentence to be true during this break.

But sometimes the gaps are too large, and the progressive shouldn’t be true.

~~“Siobhan is riding her bike.”~~

So we need a notion of connectedness between the two subevents.

Cross-temporal identity

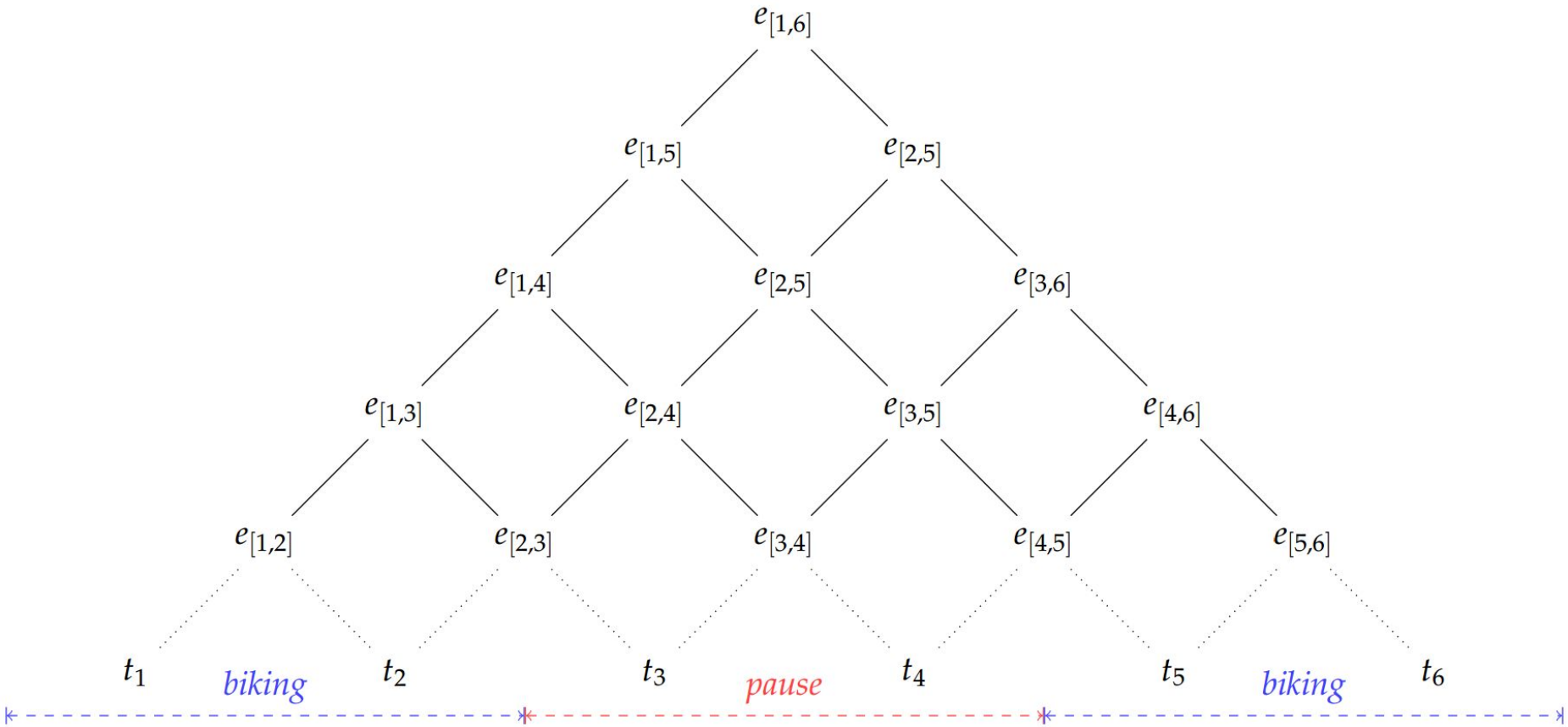
$e_1 \sim e_2$

"e_1 and e_2 count as 'one and the same event', i.e. for counting purposes e_1 and e_2 count as one event."

(Landman 2008)

biking

biking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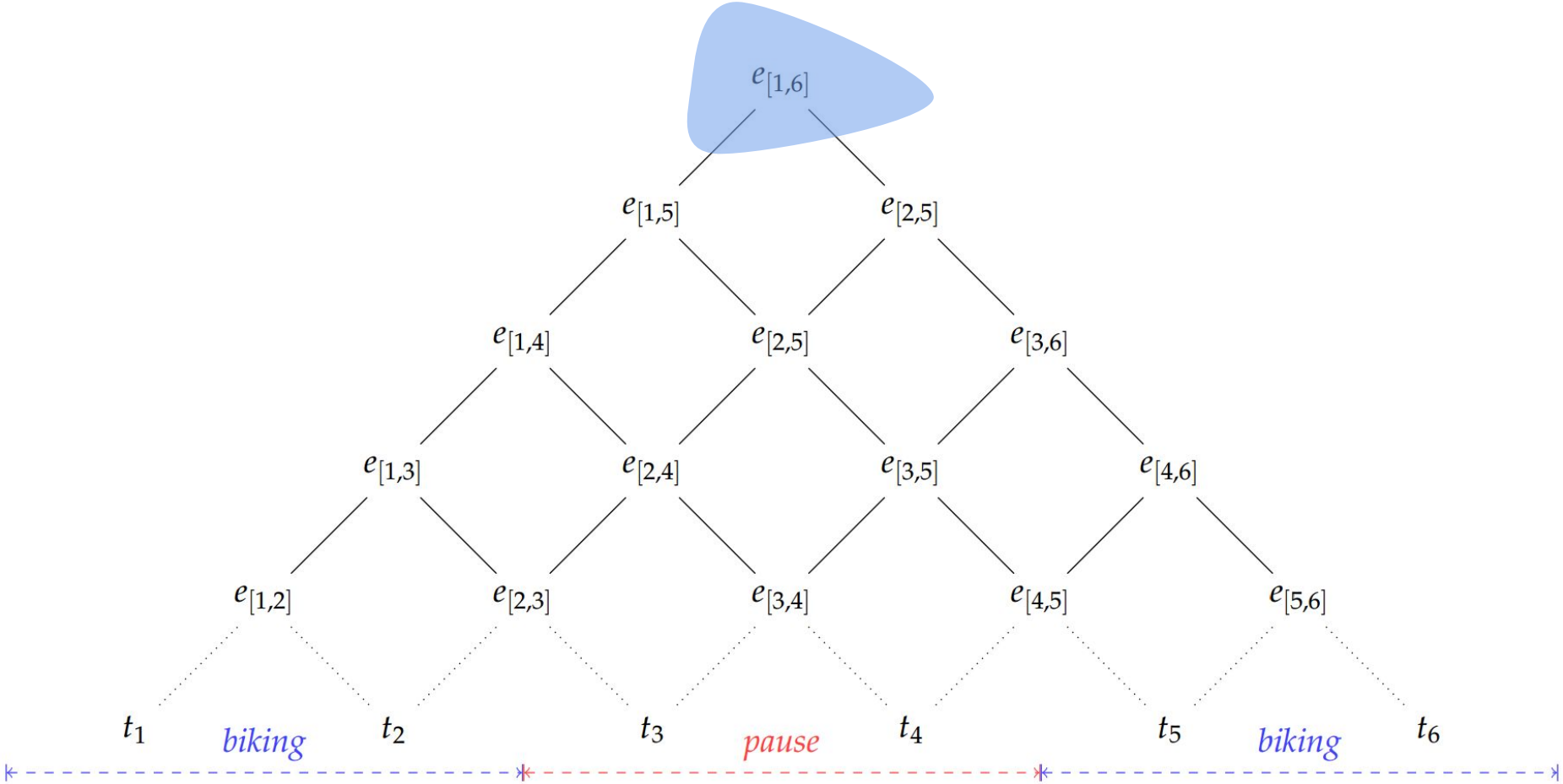
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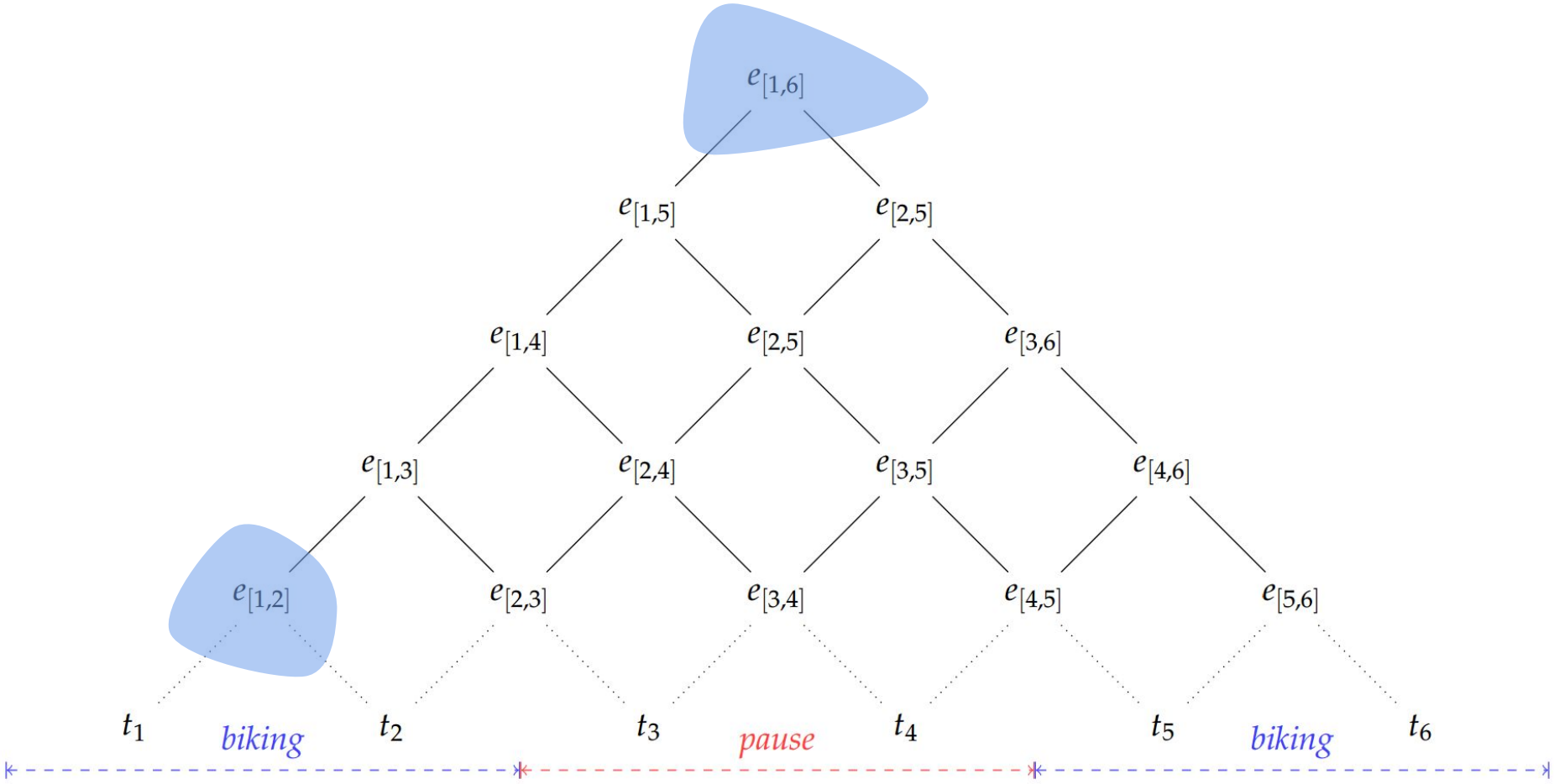
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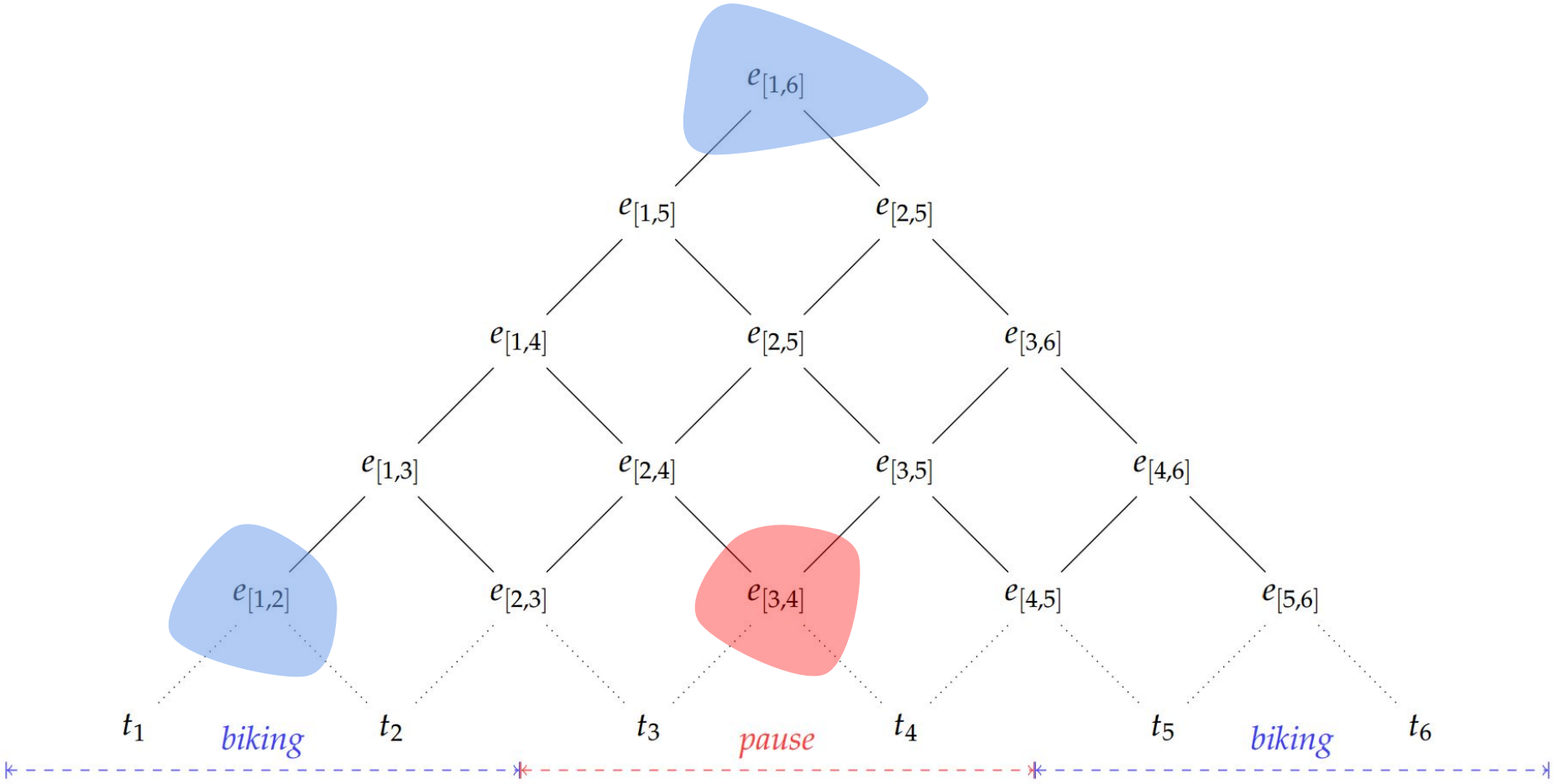
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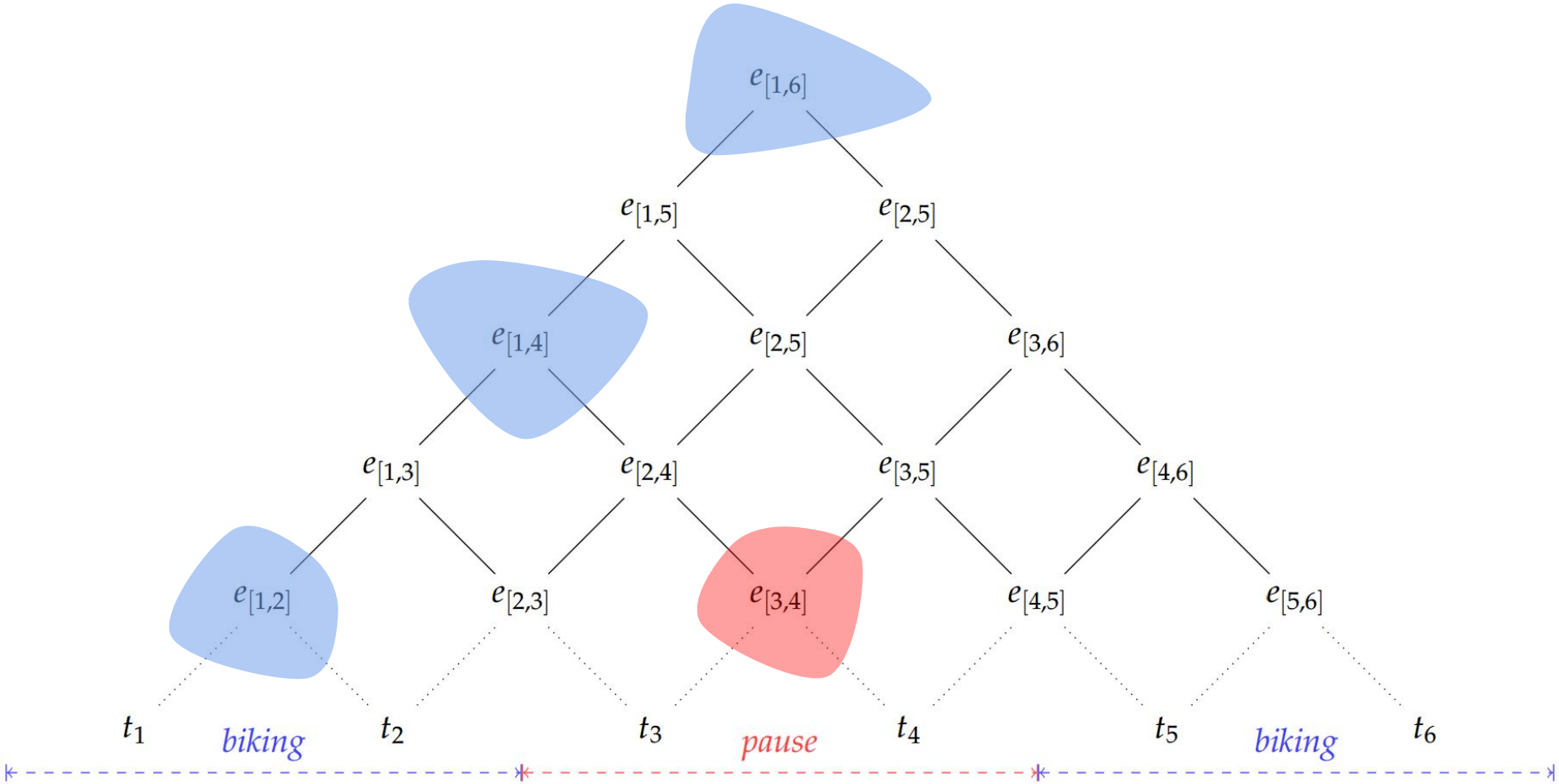
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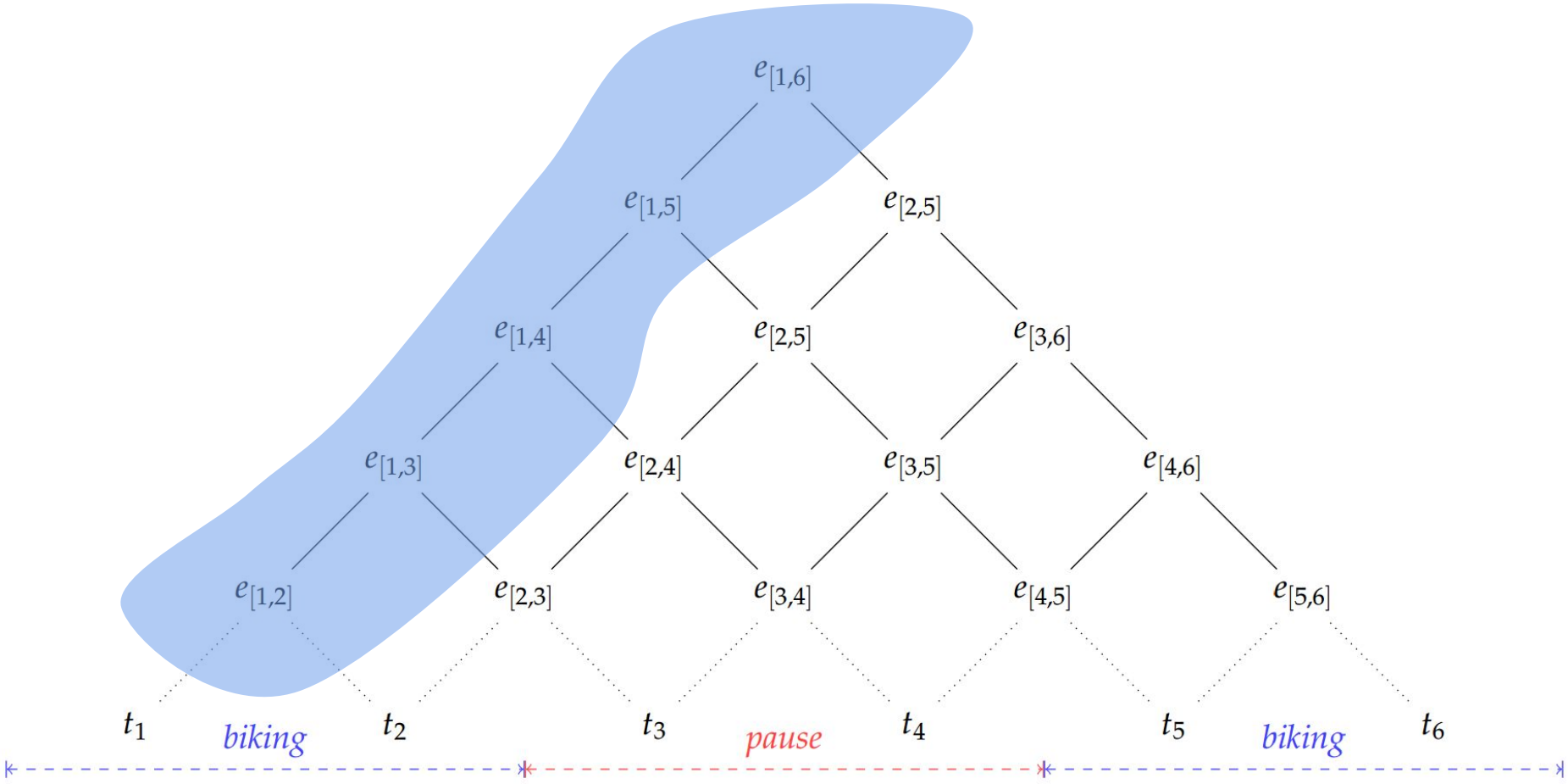
The progressive requires connectedness (cross-temporal identity) along the left edge.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t_1
biking
t_2
t_3
pause
t_4
t_5
biking
t_6

An event is a **stage** of another when it is a **cross-temporally identical part** of that event.

Initial-stage-of (i-$\preccurlyeq_e$):

$$\lambda e_1 \lambda e_2 . e_1 \sqsubseteq_i e_2 \wedge e_1 \sim e_2$$

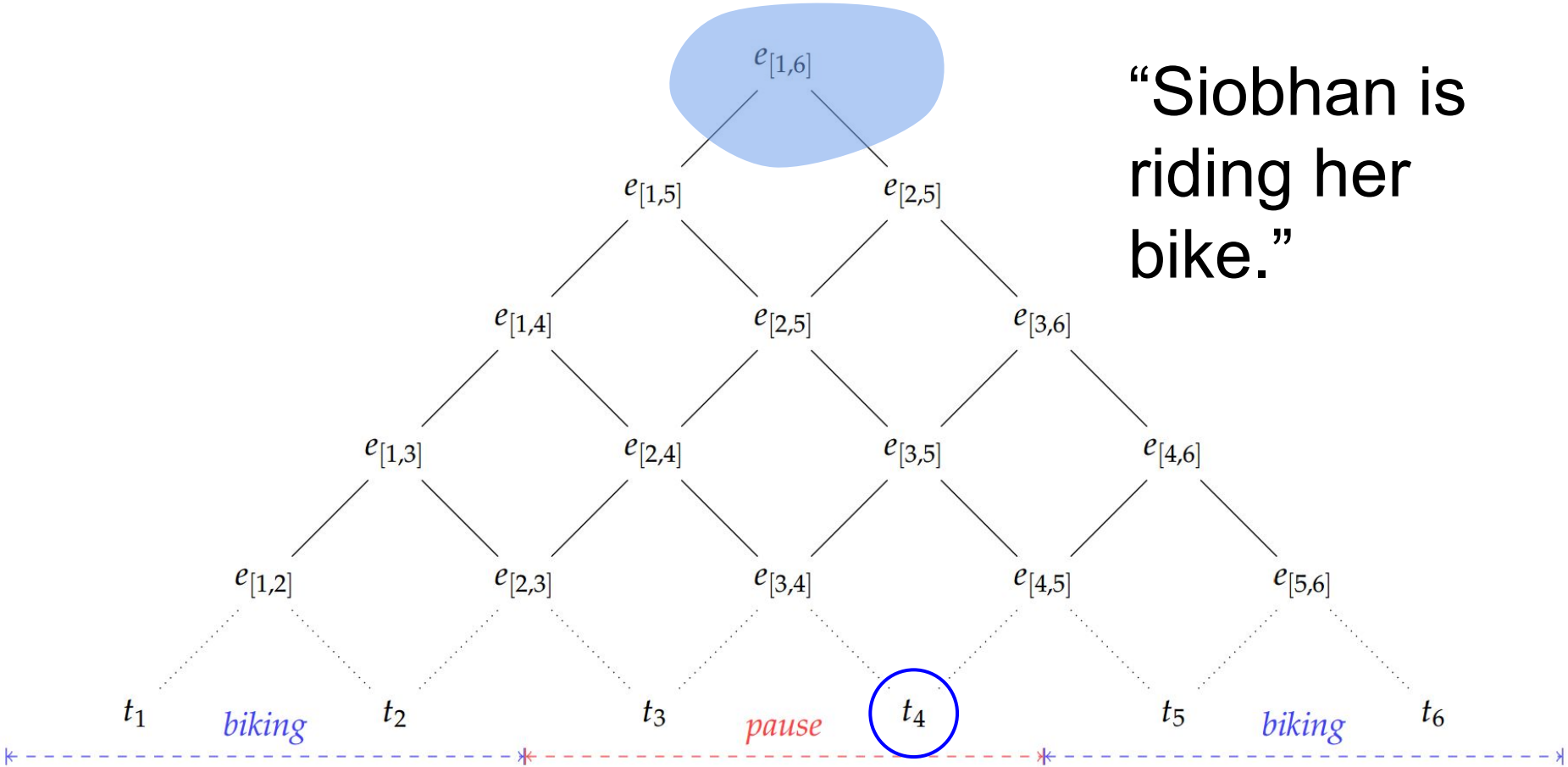
$$[\![\textbf{PROG}]\!] =$$

$$\lambda P \lambda i \lambda w.\, \exists\, e[i = \mathrm{end}(\tau(e)) \wedge$$

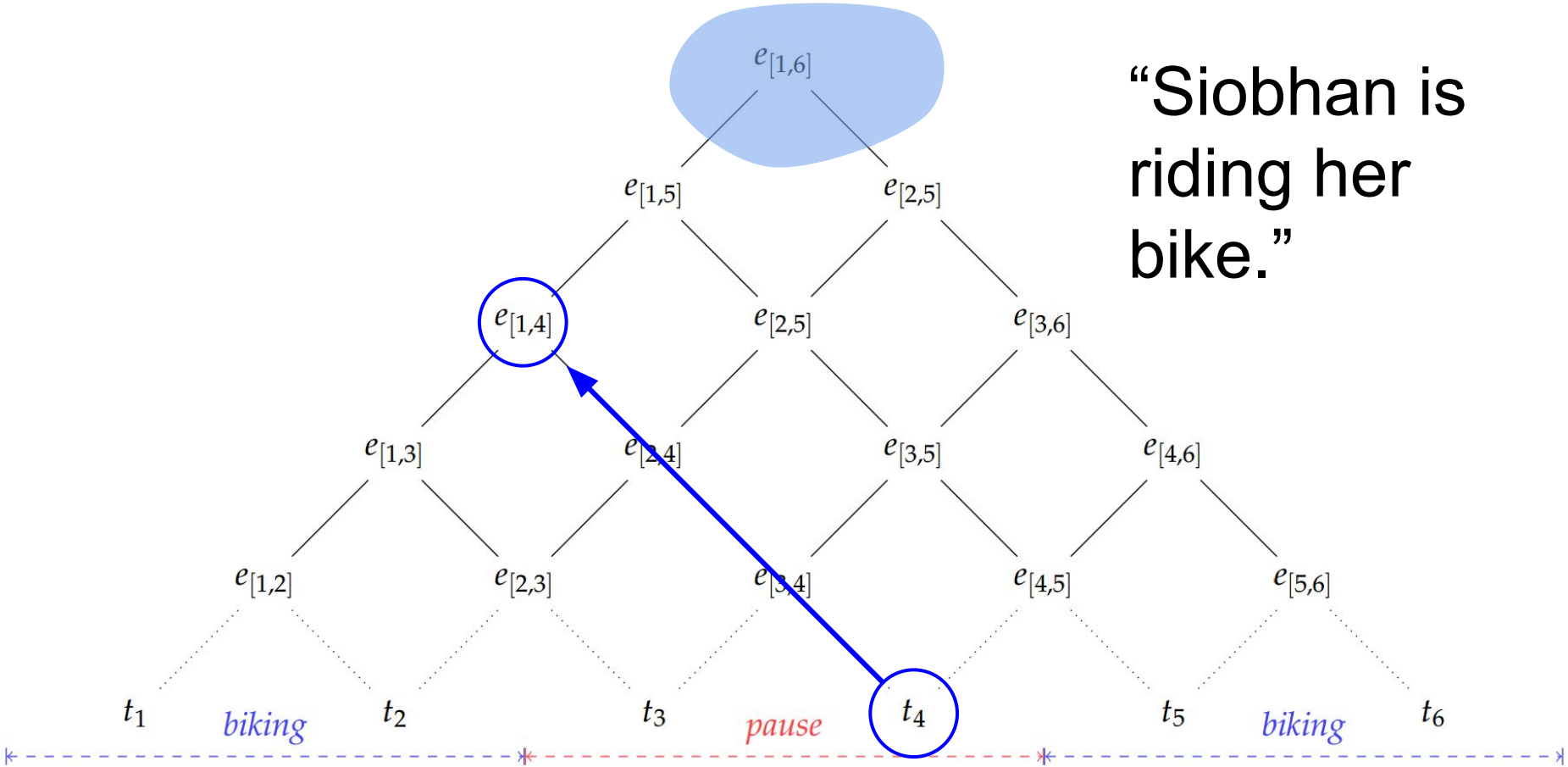
$$\exists\, e_1, w_1\, [i\text{-}\preccurlyeq e(e, e_1) \wedge$$

$$\langle e_1, w_1 \rangle \in \mathrm{Cont}(e, w) \wedge$$

$$P(e_1, w_1)]]$$



"Siobhan is riding her bike."



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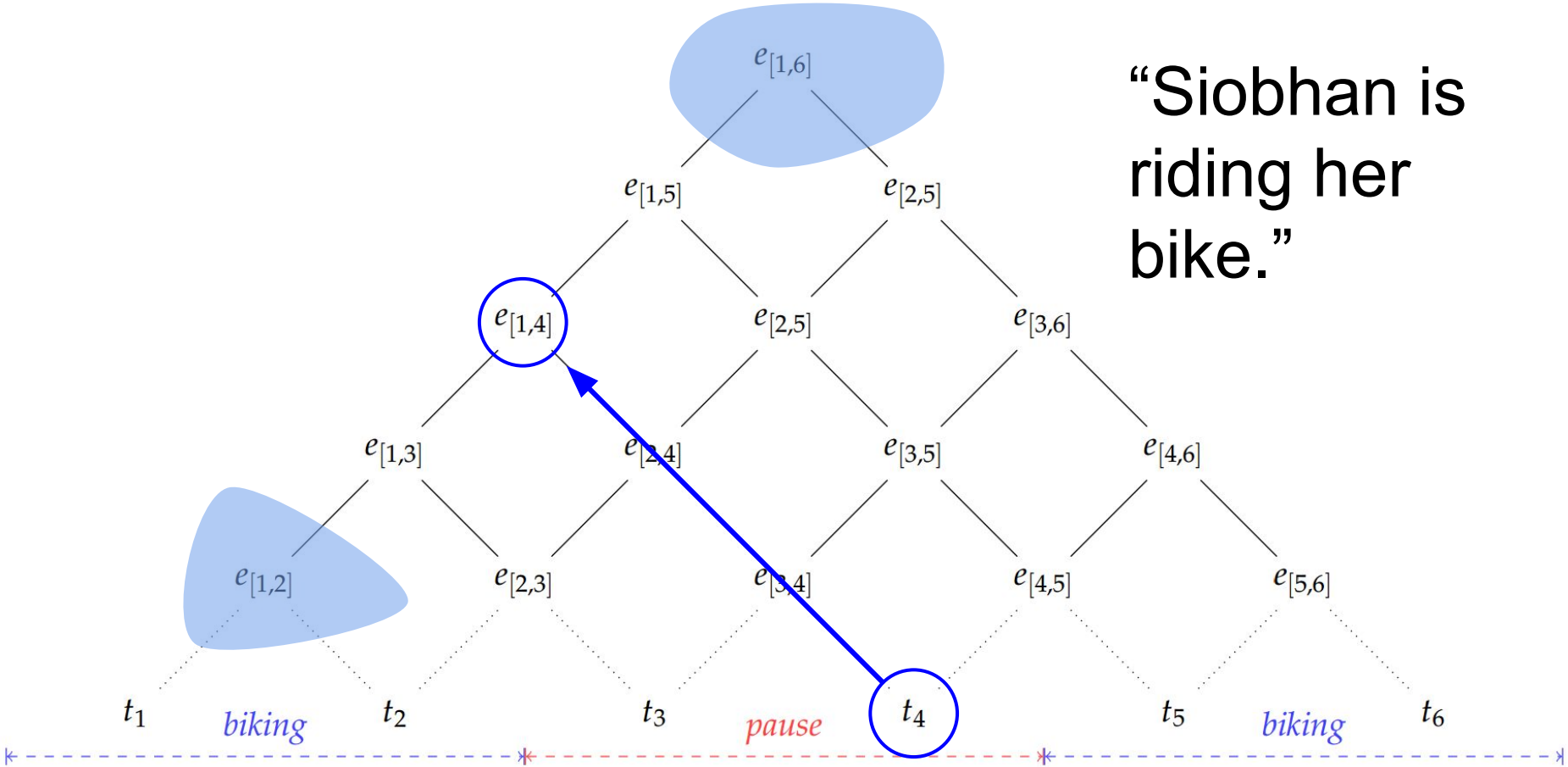

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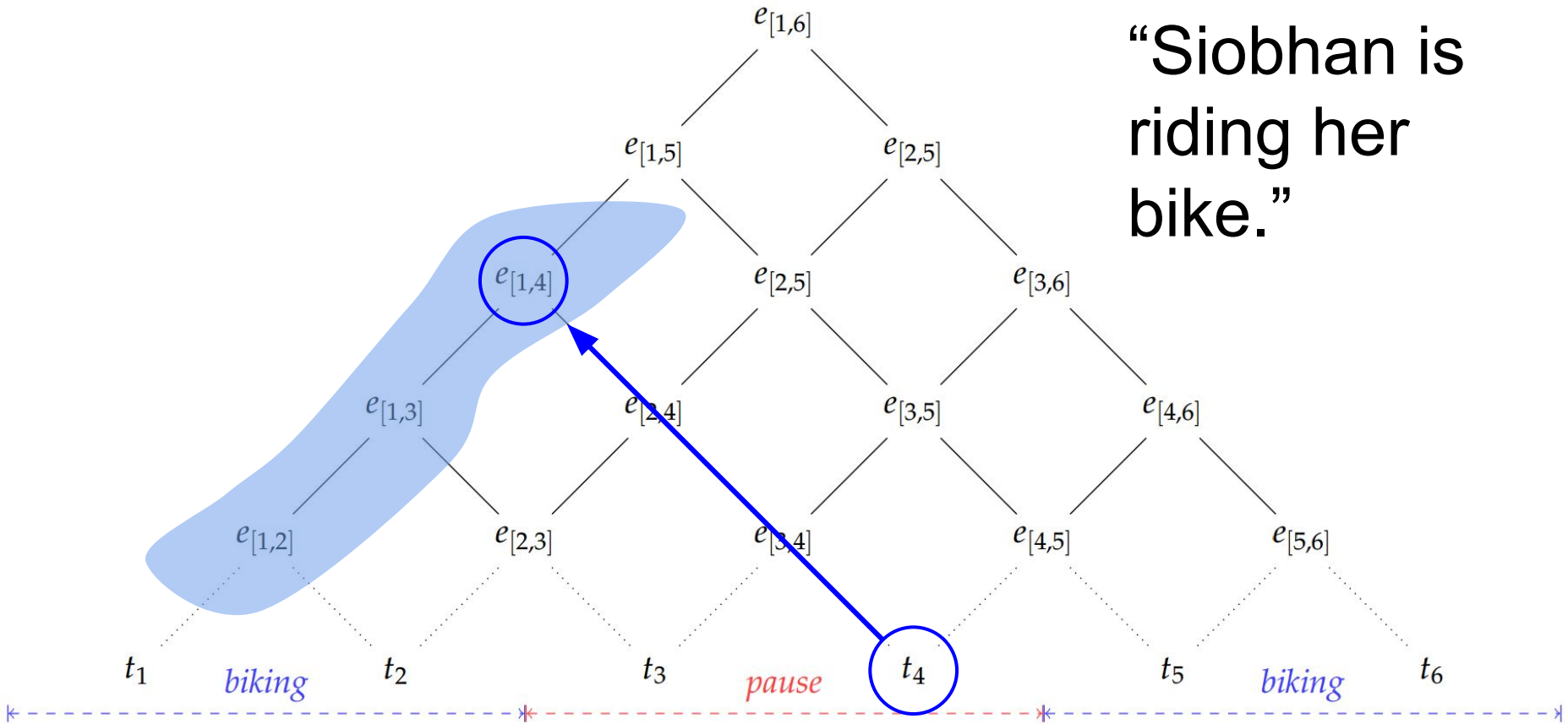

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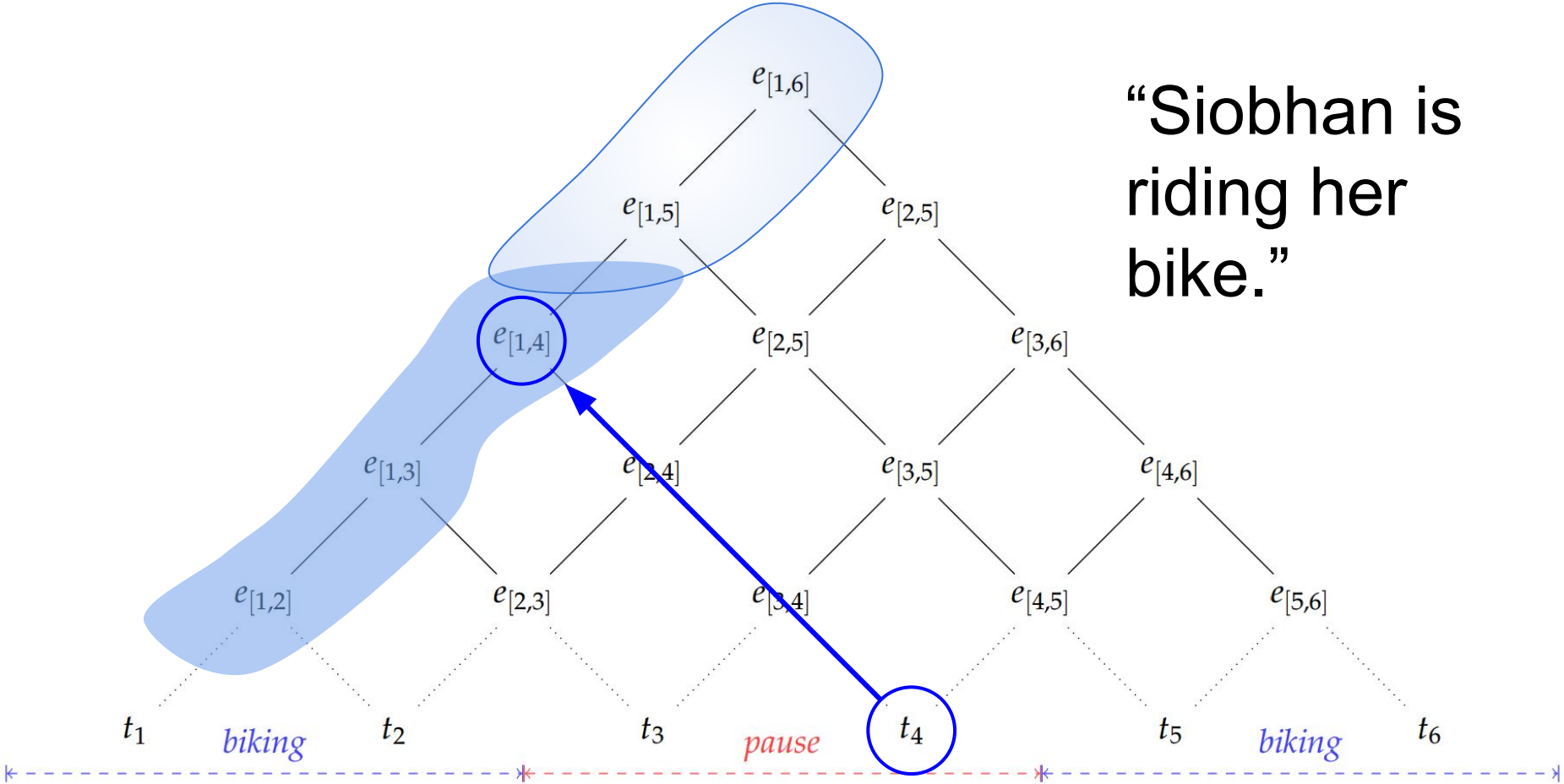

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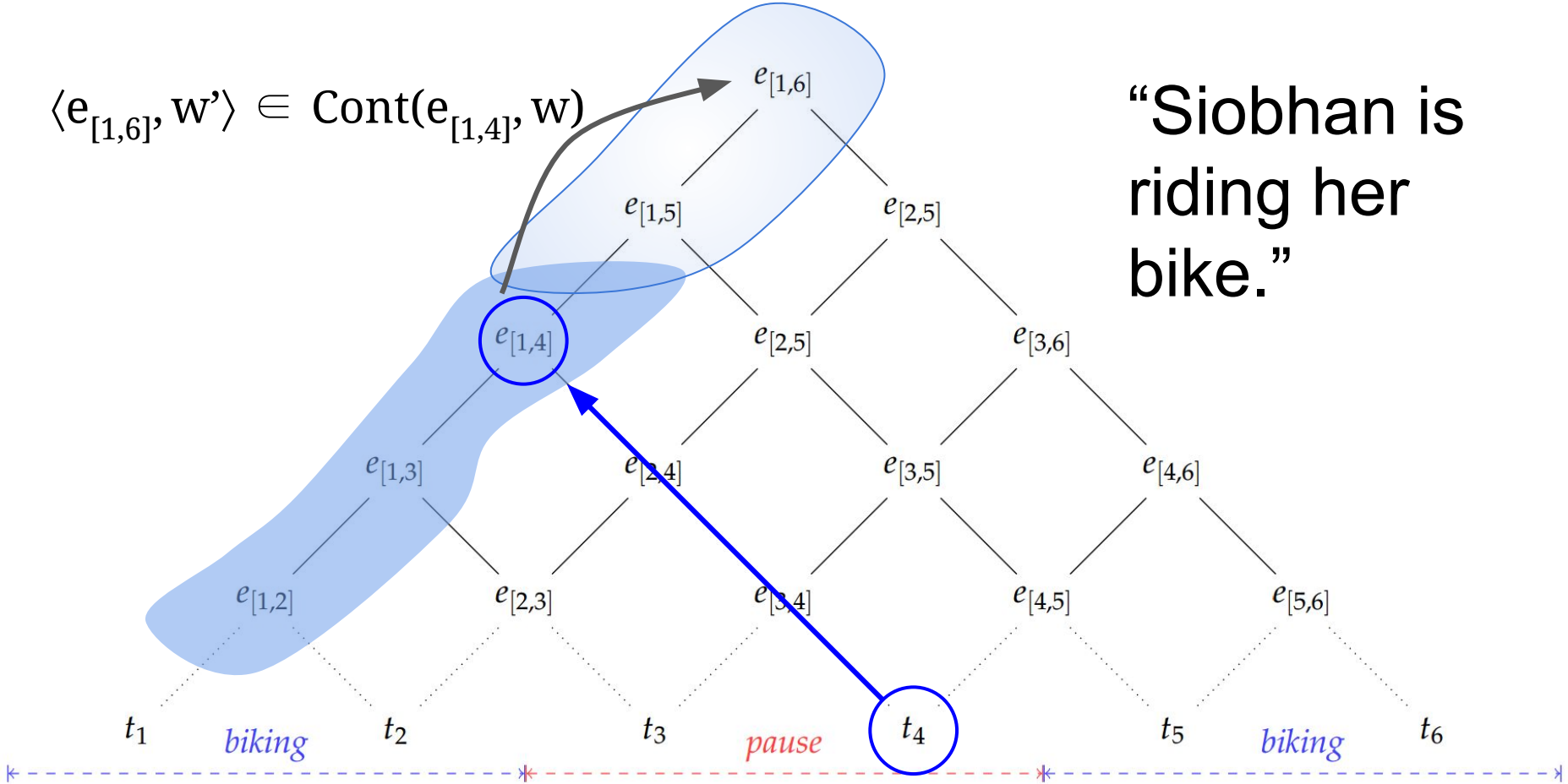
⟨e[1,6], w'⟩ ∈ Cont(e[1,4], w)
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t1
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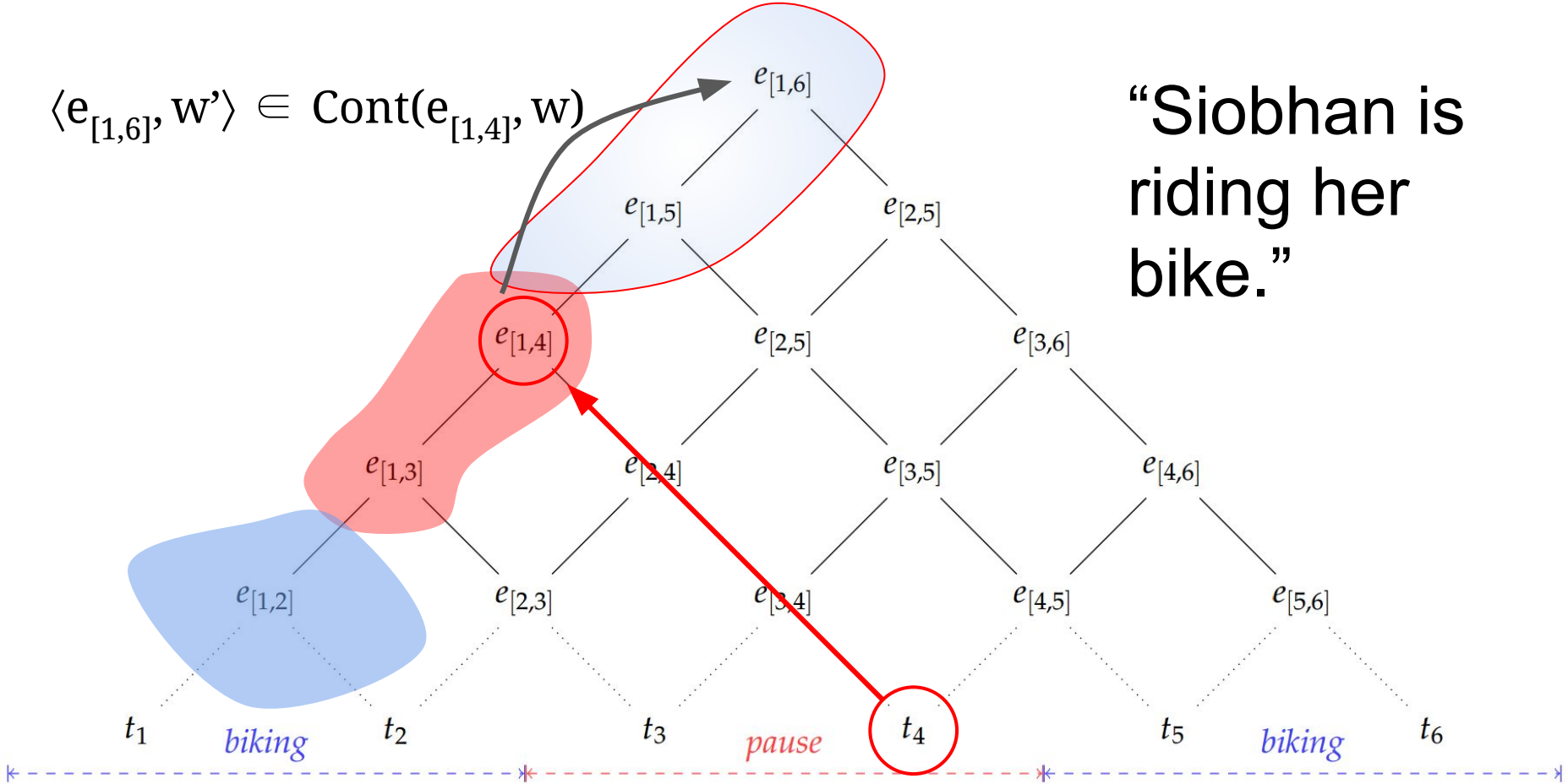
The progressive denotes parts of events that maintain cross-temporal identity up to culmination.

When the gap is too large, cross-temporal identity is disrupted.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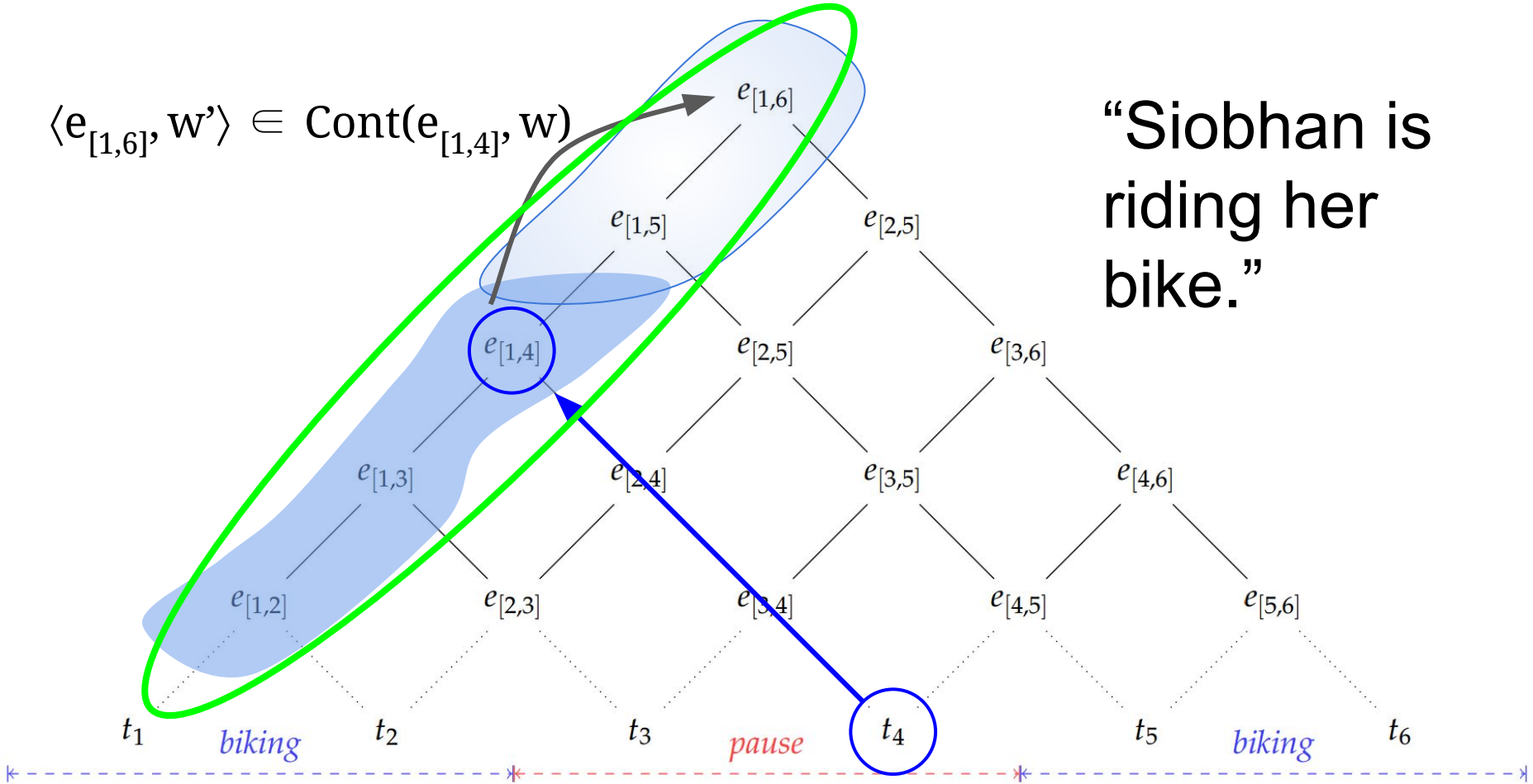
The point here is that there are two notions working in tandem:

- a notion of connectedness (defined using cross-temporal identity) and
- a classic notion of imperfectivity, defined using event parthood.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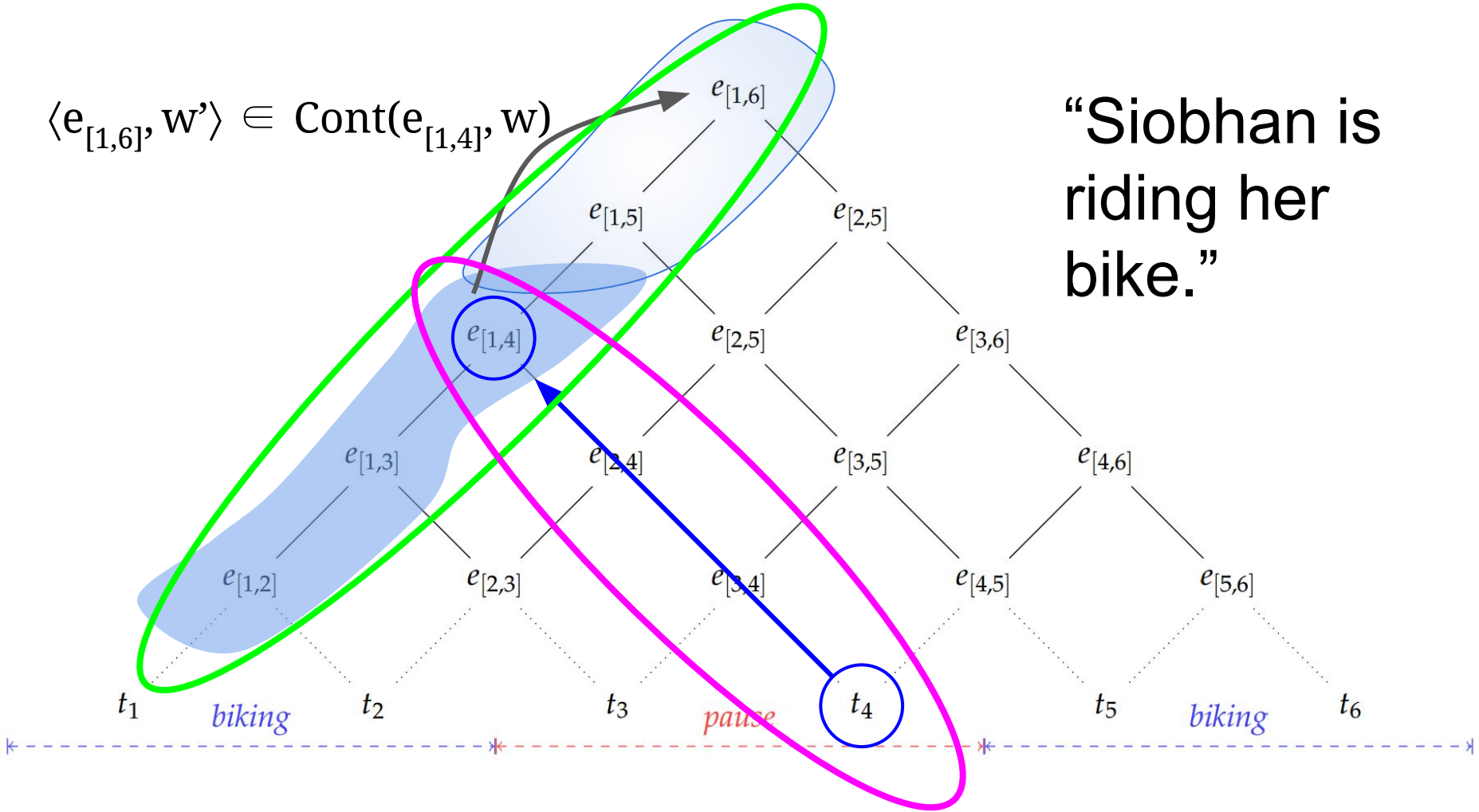
Imperfectivity (Klein 1994, Kratzer 1998)

The reference time is included in the event time.

$$\lambda P.\ \lambda i.\ \exists e : i \subseteq \tau(e)\ \&\ P(e)$$

(There is also some modal component.)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Habitual imperfectives are **anti-connected**.

Progressives: connected
+ imperfective

Habituals: anti-connected
+ imperfective

Bybee, Perkins, and Pagliuca 1994

Iterative > Continuative > **Progressive**

> Imperfective

Iterative > Frequentive > **Habitual**

Event-external and event-internal pluractionality

Event-external pluractionality

Pluractionality *stricto sensu* (Mattiola 2020)

Events are distinct, and spatio-temporally disconnected. Events may be repeated multiple times on the same occasion or across different occasions.

Balinese (Lund 2021)

Ayu ngajeng~ajeng biu
Ayu AV.eat-REDUP banana
“Ayu is eating bananas.”

✘ Ayu is taking bites of one banana.
✔ Ayu is eating a bunch of bananas.
✔ Ayu likes to eat bananas, but is not currently eating them.

Event-internal pluractionality

Singular events that are internally complex.

“Intuitively, event-internal pluractionals denote plural events that have the character of a single event. It is as if the repetitions that compose the plurality take place internal to an event that is conceived of as a single happening.” (Henderson 2017)

Nibble ≈ several little bites

Yurok (Wood 2007)

kich pegpegoh ku ‘yohlkoych’
PERF split.PLUR1 ART log
‘I made the log into kindling (split it multiple times)’

Key differences (Wood 2007; Henderson 2017)

- **Spatio-temporal contiguity**
- Aspectual selection
- Shared telos
- Cardinality
- Genericity/habituality
- Base-predicate entailments

Pluractionals in general hold true of multiple events satisfying some predicate.

$[\![\textbf{PLUR}]\!] =$

$\lambda P \lambda e \lambda w.\ {}^{*}P(e)(w) \ \wedge$

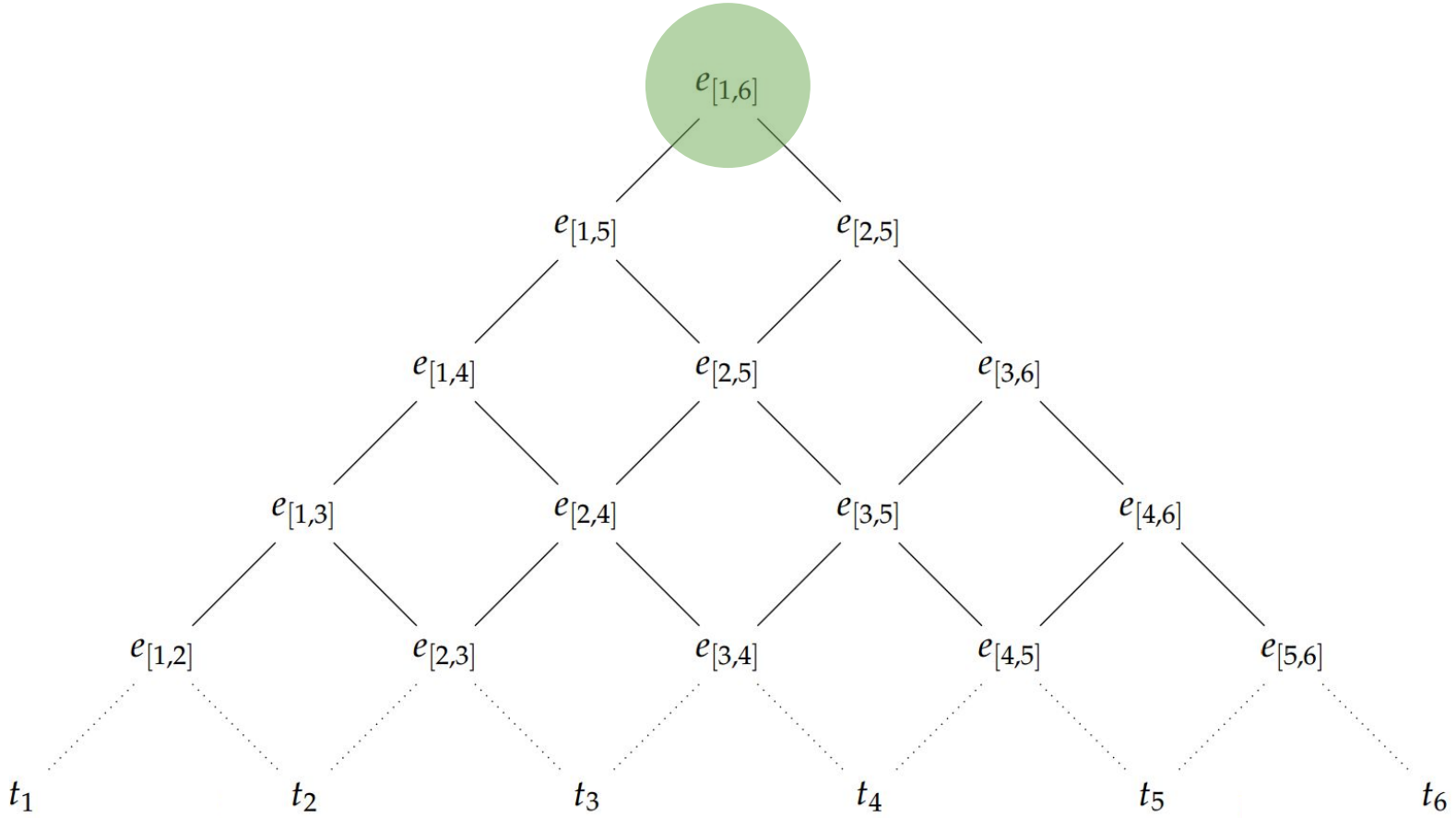
$\text{Card}(e) > n$

Previous formal approaches to the split

- (Atomic) group reference vs. true plural reference (Wood 2007; Tovena & Kihm 2008; Henderson 2012)
- Conditions on temporal traces of events (van Geenhoven 2004; Henderson 2012)

Pluractionality and connectedness

For event-external pluractionals, we want to make sure we aren’t picking up event parts.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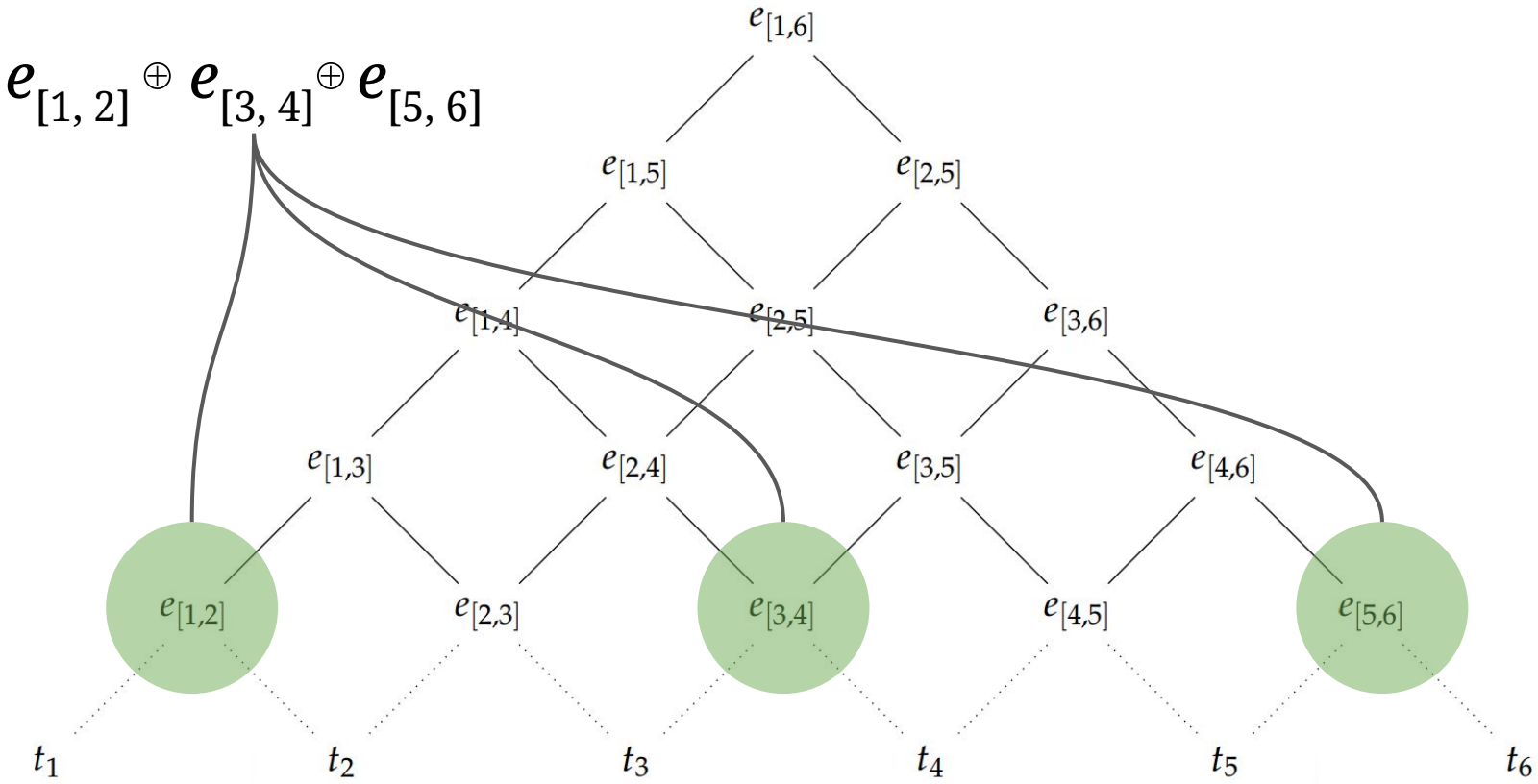
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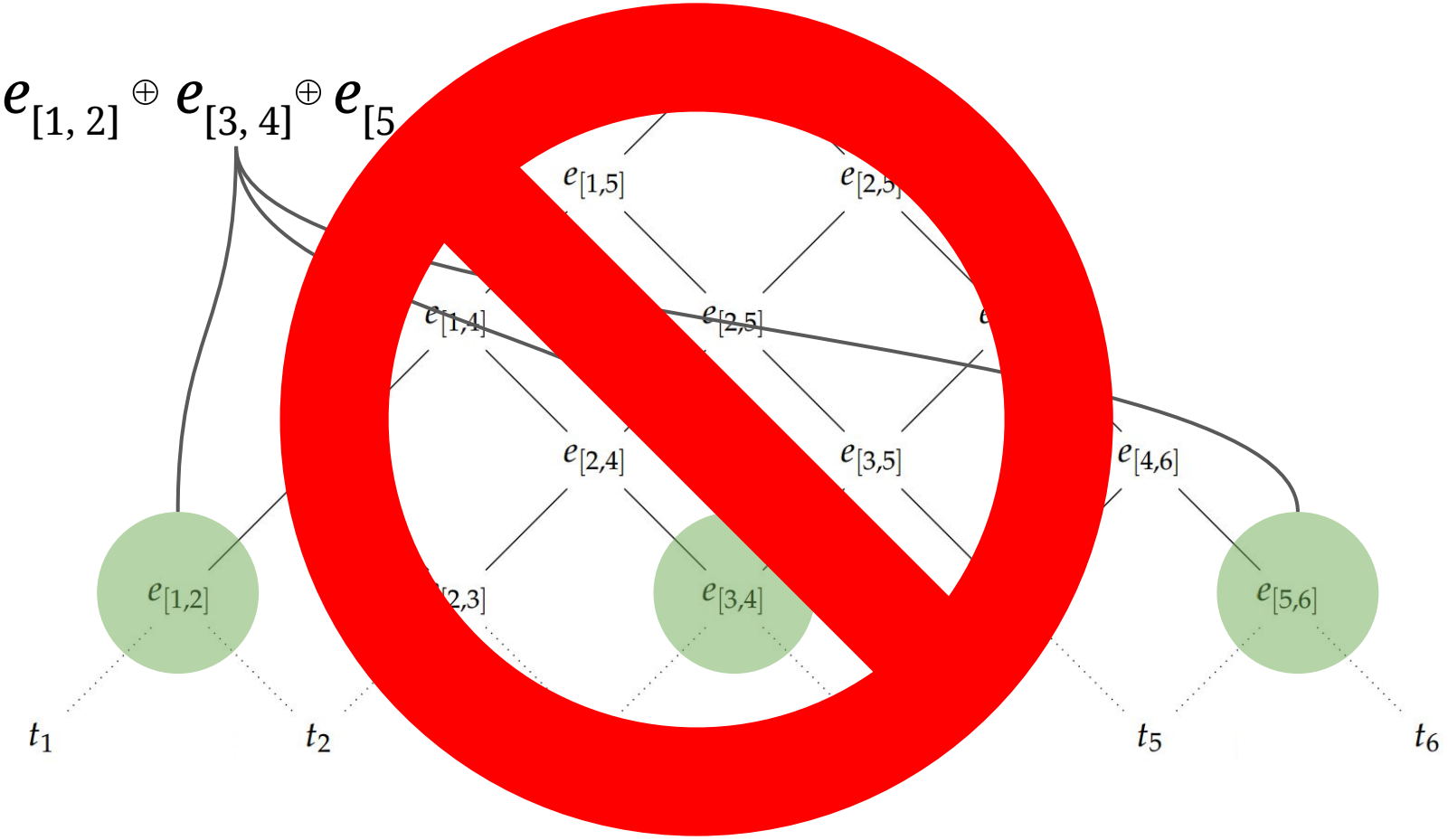
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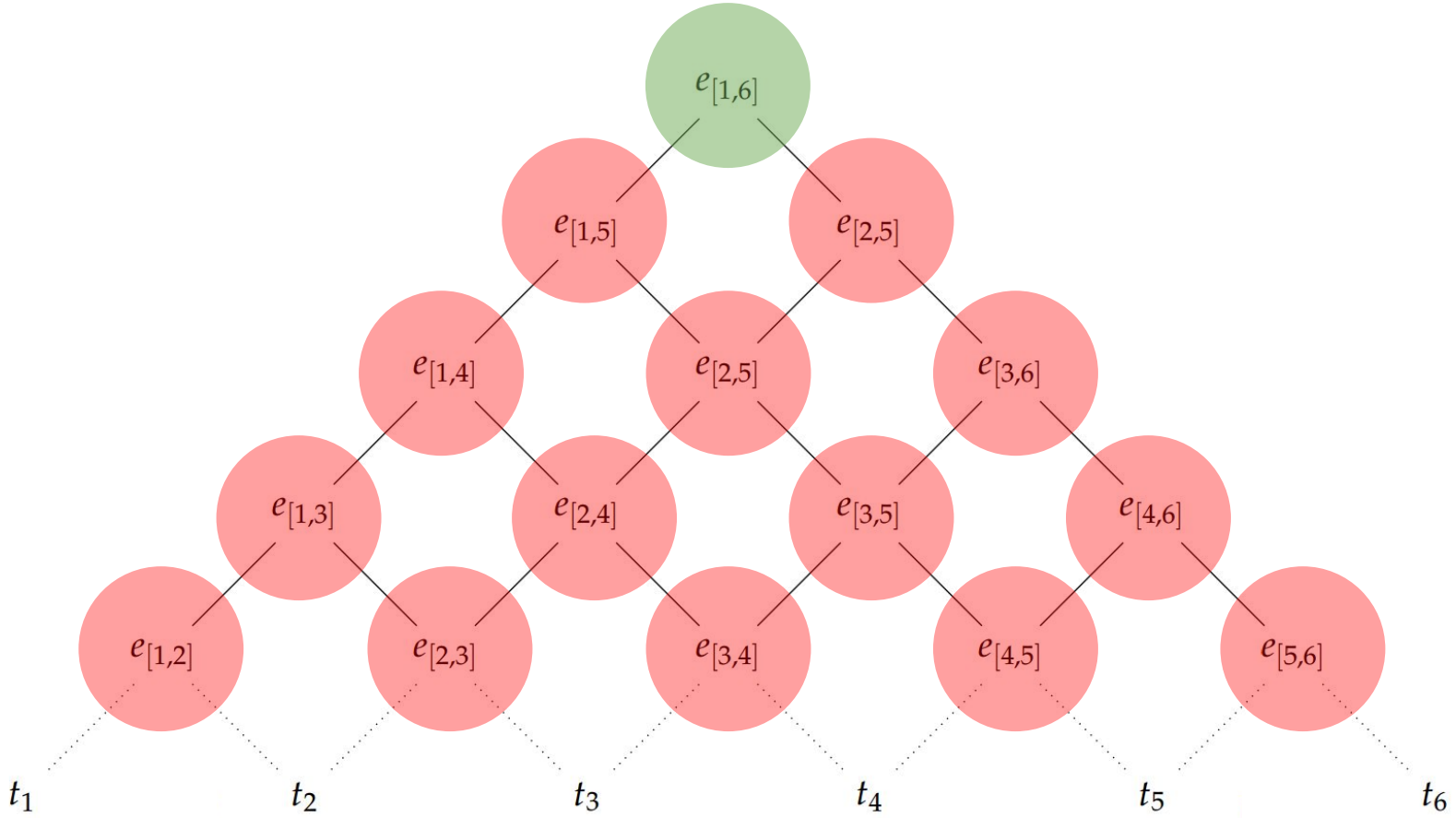
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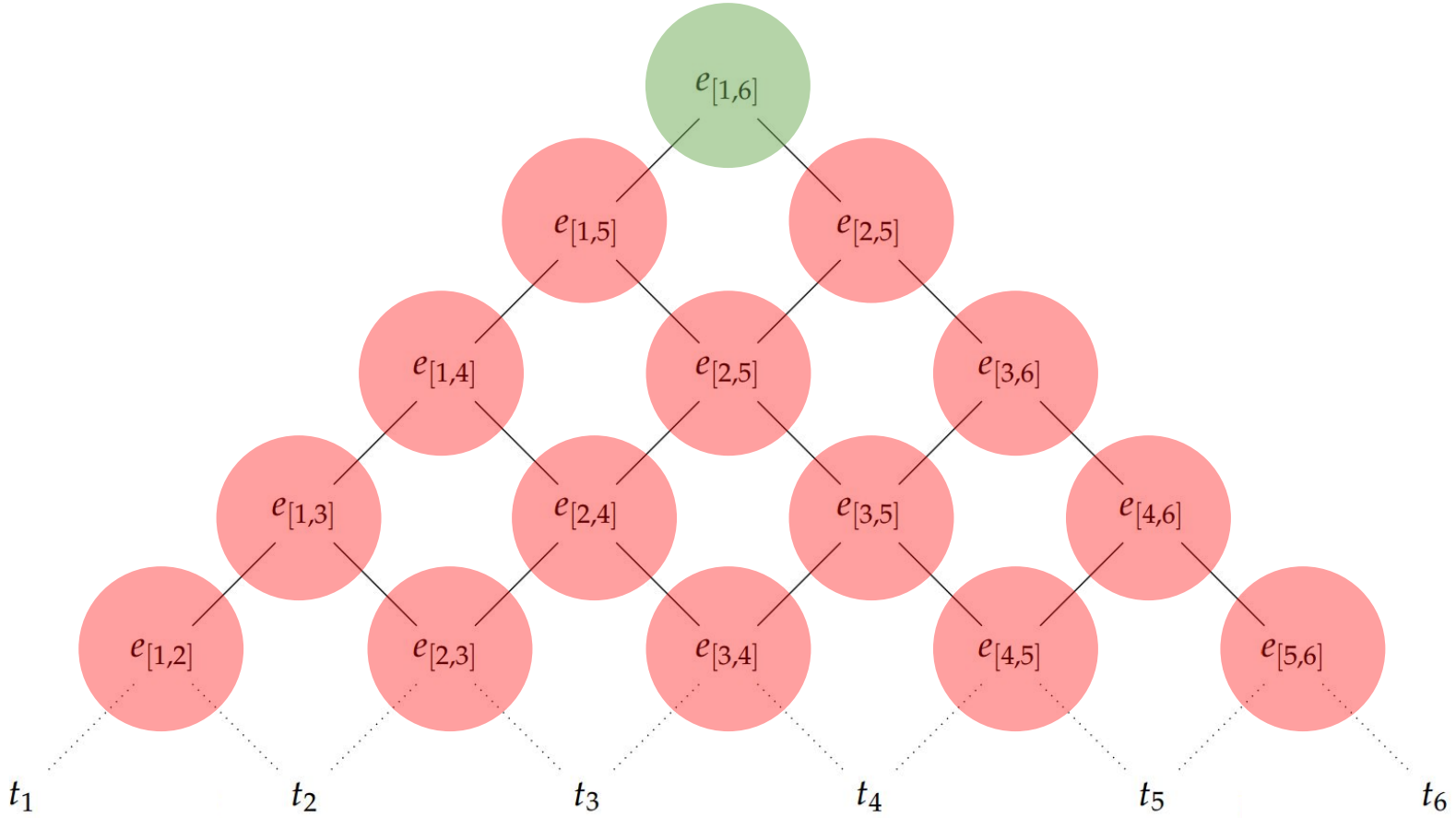
For event-external pluractionals, we only want events that are cross-temporally maximal.

Max:

$$\lambda P \lambda e \lambda w.\ {}^{*}P(e)(w) \wedge \forall e' [{}^{*}P(e')(w) \wedge e' \sim e \rightarrow e' \sqsubseteq e]$$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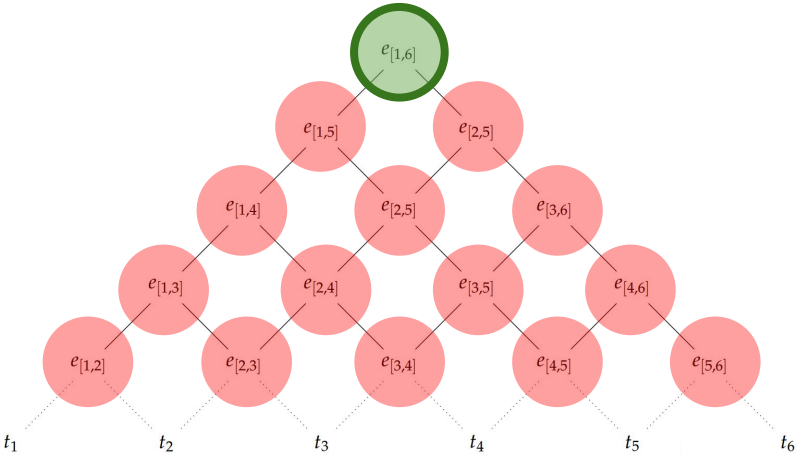
$[\![\mathbf{PLUR^{ext}}]\!] =$

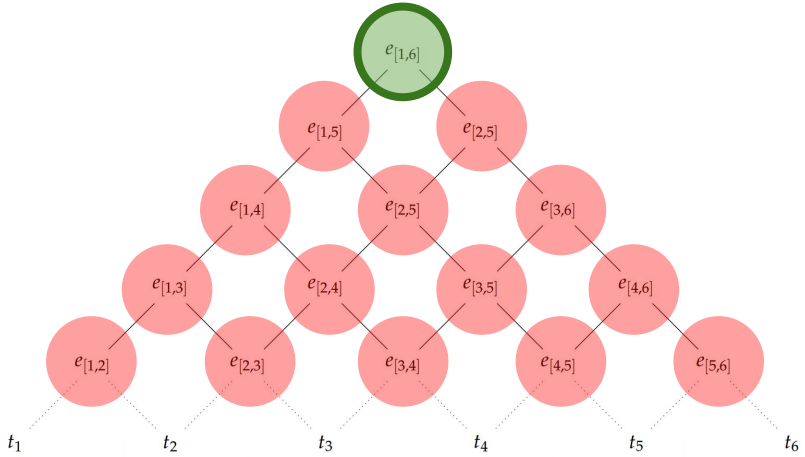
$\lambda P \lambda e \lambda w.\ {}^{*}P(e)(w) \ \wedge$

$\mathrm{Card}(e) > n \ \wedge$

$\underline{\forall e' \left[e' < e \rightarrow \mathrm{Max}(P)(e')(w)\right]}$

The subevents of the plural event must be cross-temporally distinct.


$e_{[1,6]}$
$e_{[1,5]}$ $e_{[2,5]}$
$e_{[1,4]}$ $e_{[2,5]}$ $e_{[3,6]}$
$e_{[1,3]}$ $e_{[2,4]}$ $e_{[3,5]}$ $e_{[4,6]}$
$e_{[1,2]}$ $e_{[2,3]}$ $e_{[3,4]}$ $e_{[4,5]}$ $e_{[5,6]}$
t_1 t_2 t_3 t_4 t_5 t_6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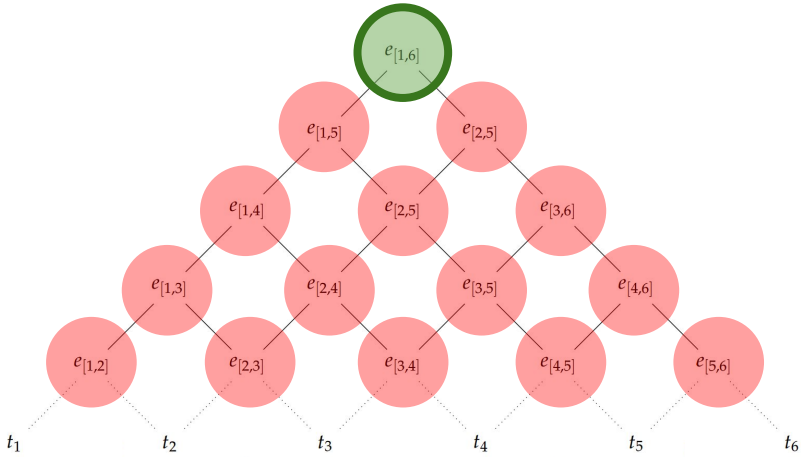
t_1 t_2 t_3 t_4 t_5 t_6


$e_{[1,6]}$
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$e_{[1,2]}$ $e_{[2,3]}$ $e_{[3,4]}$ $e_{[4,5]}$ $e_{[5,6]}$
t_1 t_2 t_3 t_4 t_5 t_6

But for event-internal pluractionals, we want an amalgamation of events that are anti-maximal.

In other words, cross-temporal identity must be maintained over the event subparts!

$[\![\mathbf{PLUR}^{\mathbf{int}}]\!] =$

$\lambda P \lambda e \lambda w.\ {}^{*}P(e)(w) \ \wedge$

$\mathrm{Card}(e) > n \ \wedge$

$\underline{\forall e' \ \forall e''[e', e'' < e \rightarrow e' \sim e'']}$

Event-external pluractionals are anti-connected.

Event-internal pluractionals are fully connected.

These two conditions mirror a crucial difference between the progressive and habitual aspects.

Pluractionals have constraints on connectedness like the progressive and habitual.

They differ in that they aren’t modal and don’t interact with the reference interval.

Thinking back to the cline(s), we can now define it as the addition of imperfectivity *per se*, and the subsequent loss of connectedness (and pluractionality).

Bybee, Perkins, and Pagliuca 1994

Iterative > Continuative > Progressive

> Imperfective

Iterative > Frequentive > Habitual

Pathways, redefined

PLUR > PLUR+**INT** > (PLUR)+INT+**IMPF**

> IMPF

PLUR > PLUR+**EXT** > PLUR+EXT+**IMPF**

Jaminjung (Schultze-Berndt 2012)

- Jaminjung has an apparent progressive construction formed using a pluractional clitic (*mayan)* and a particular light verb.
- The pluractional can be event-internal or event-external depending on its syntactic position.
- Schultze-Berndt shows quite convincingly that the apparent progressive construction is really just an event-internal pluractional composing with a light verb in the present tense, where imperfectivity is unmarked in the present.
- This might give some clue as to how imperfectivity gets introduced in the meaning of a pluractional marker; zero-marked imperfectivity gets incorporated into the meaning of the pluractional exponent.

Case study: ASL

Reduplication is pluractional in ASL

(Fischer 1973, Klima & Bellugi 1979, Rathmann 2005, Kuhn & Aristodemo 2017)

ASL is argued to encode event structure *iconically*.

(Wilbur 2003, 2008; Kuhn 2017)

The temporal properties of the sign correspond to the temporal properties of the event.

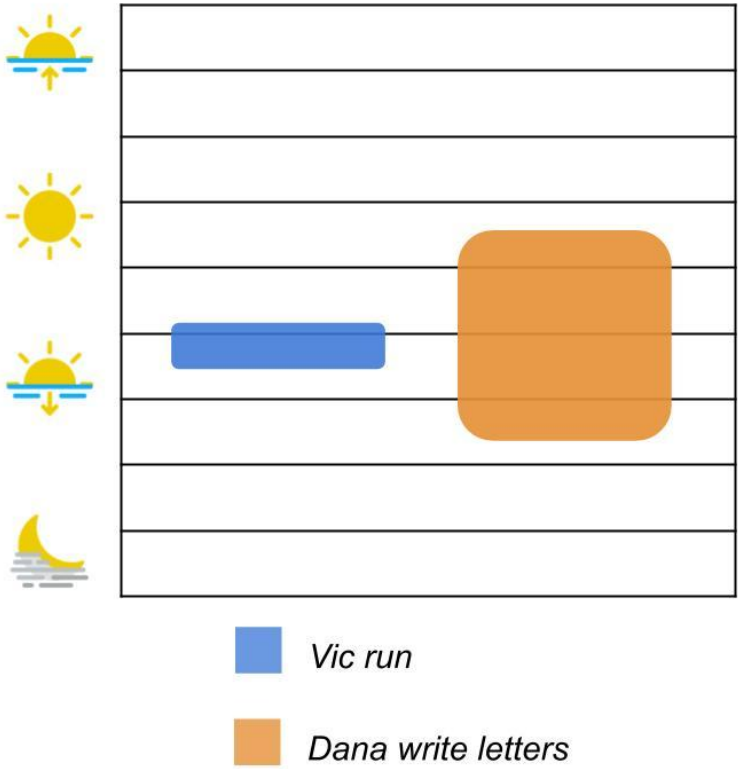
I wanted to know how nuances in aspectual meaning are expressed in ASL, and devised an elicitation survey.

Lund (2021): reduplication is better understood as a general imperfective marker.

The survey compares the temporal properties of **habitual scenarios** to analogous ones in **episodic scenarios.**

It particularly focuses on temporal delimination: how long one event is relative to another.

The participant was asked to describe a pictorial scenario in ASL.



Episodic scenario

Habitual scenario

4 x 2 x 2 design:

1. Aktionsart class: activity, accomplishment, achievement, semelfactive.
2. Habitual vs. Episodic
3. Temporally including or included

I found that **reduplication was consistently used across habitual and episodic scenarios.**

BLAKE RUN BEACH [Episodic]

BLAKE RUN BEACH [Habitual]

I argued that the most parsimonious explanation is that reduplication is a general imperfective marker in ASL.

An alternative: the episodic cases are actually still pluractional.

Flexible accomplishments (Wright 2014)

Predicates like *eat a slice of pizza* or *drink a coke* in English are usually interpreted telically, but telic interpretations are less salient in ASL.

Wright (2014): the smallest event that counts as, e.g., a drinking event is taking a sip. This is a minimal atomic event of drinking. The sign DRINK iconically resembles this minimal atomic event, making the minimal atomic event interpretation more salient.

Minimal atomic events (Wright 2014)

PIZZA, CL_{round}, #RAY **EAT++**, **NOT-A-TRACE**.
‘Ray ate the whole pizza.’

BOOK, #RAY **READ++**, **END**.
‘Ray read the book to the end.’

Language internal factors may make distinguishing pluractional and imperfective markers very difficult.

Thank you!