

“Verbs and Times”

Vendler (1957)

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Tense and Aspect

In French, aspect is most visible in the difference between passé simple and imparfait (we'll get back to that). Both are pas tenses.

* Tense

- * "Locates" an eventuality in time.
- * For example by indicating past, present or future.

Though Vendler speaks of "finer aspects" in the second paragraph, he seems rather more vague about what these aspects are actually. I am unsure about whether there is any relation to Vendler's use of the word 'aspect' in this seminal paper and the word 'aspect' as it is now widely employed in semantics

* Aspect

- * Distinguishes between events which are completed, ongoing, habitual
- * eg. the distinction between "John read", "John was reading" and "John has read" is aspectual, in each case the eventuality is in the past.

A first division



Kamp & Reyle (1993) make only this distinction and call non-states “events”

A first division

1. The play delighted Mary.
2. Fred was angry.
3. Alan was ill.
4. The train was standing alongside the platform.
5. The statue stood in the centre of the square.
6. Susan was a pediatrician.

Kamp & Reyle (1993) also note the de distinction between states and non-states is not always that clear

Motivation for distinguishing states and non-states

- ❖ Only non-statives can be used as answers to the question “What happened?”
- ❖ Only non-statives can be used in the progressive or as imperative
- ❖ Only non-statives can occur as complements of *force* and *persuade* or with adverbs like *deliberately*, *carefully*
- ❖ Only non-statives appear in Pseudo-cleft constructions “What X did was Y”

“What X did”, and a lot of the other tests (*imperative, force/persuade, deliberately*), presuppose agency of X, so “What the storm did was destroy the village” is actually quite bad but still a clear non-state. So we should be careful with these tests, since stative implies non-agentive but non-agentive does not imply stative! So the progressive and the “what happened” tests are the most reliable.

Examples: some states

All the examples are in the simple past. This is because a peculiarity of English requires a coercion of non-states into states when they occur in the present tense.

John was ill	<input checked="" type="checkbox"/>
John knew the answer	<input checked="" type="checkbox"/>
John owned a Porsche	<input checked="" type="checkbox"/>
John stank	<input checked="" type="checkbox"/>



John stank deliberately does not seem so bad

Examples: states and non-states

John was ill, John loved Mary	<input checked="" type="checkbox"/>
John ran, John looked for a restaurant	<input type="checkbox"/>
John ran a mile, John built a house	<input type="checkbox"/>
John reached the top, John died	<input type="checkbox"/>

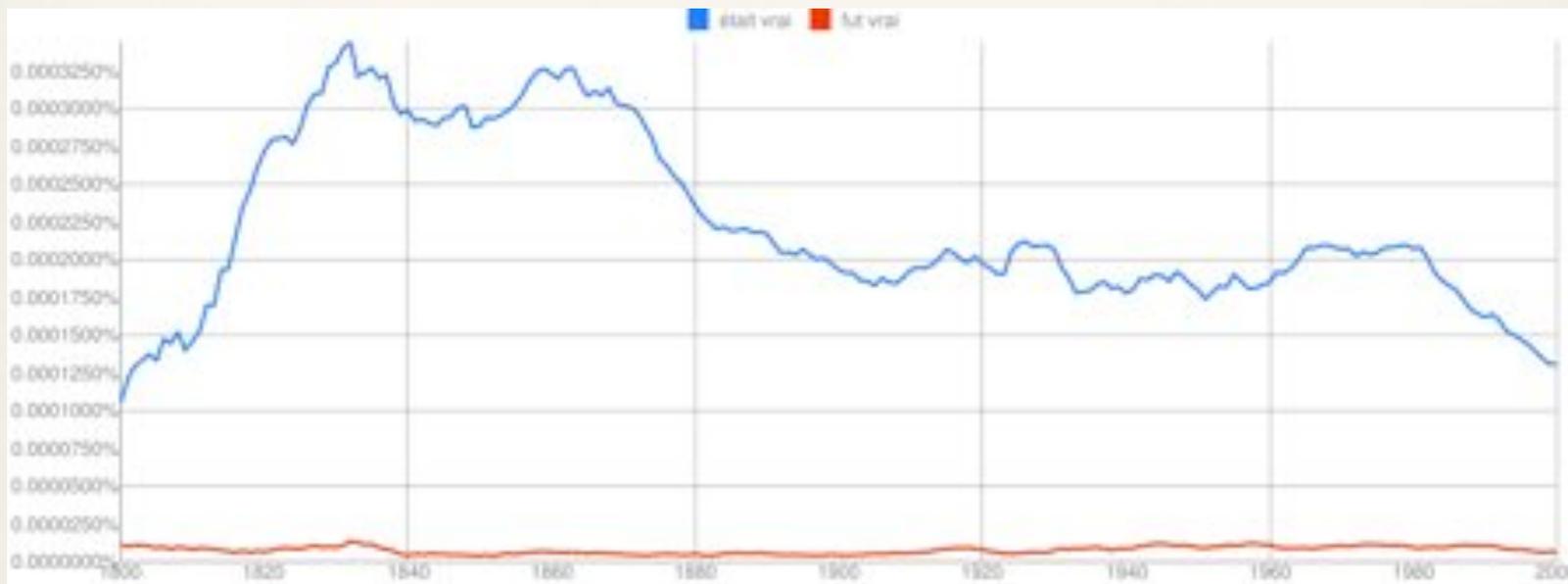


States and non-states in French

Since they only distinguish between states and non-states, this seems reasonable. However, in a state, activity, event tripartition, *imparfait* corresponds to either a state or an activity and *passé simple* corresponds to an event

- * Kamp & Rohrer (1983) suggest that French *imparfait* verbs denote states and French *passé simple* verbs denote non-states.
- * For the moment, we will assume this is the case. We will give a slightly more refined analysis later.
- * Let's do a (preliminary) verification of this claim using the Google n-grams data.

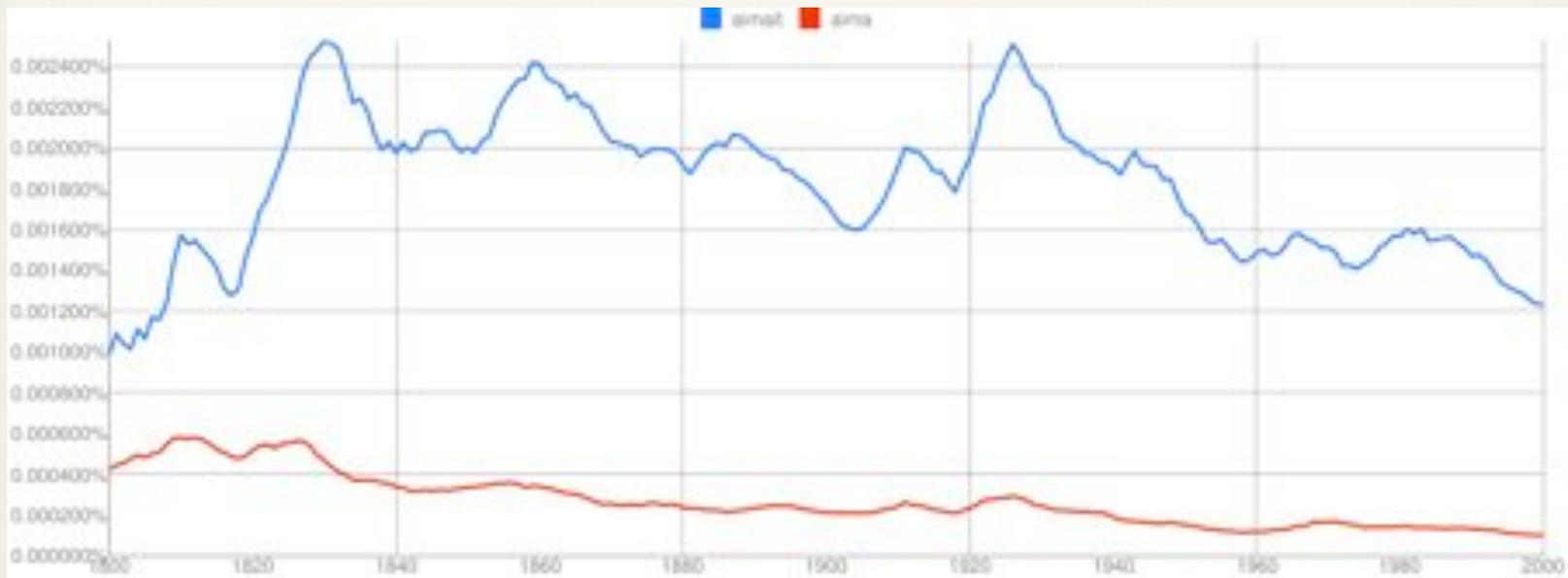
Imparfait vs. Passé Simple



"était vrai" has been deliberately chosen, of course, since this is a much clearer case of a state than "était vert" which more easily allow an inchoative reading (ie. a reading which describes the beginning of a state, such as "Soudain, John knew").

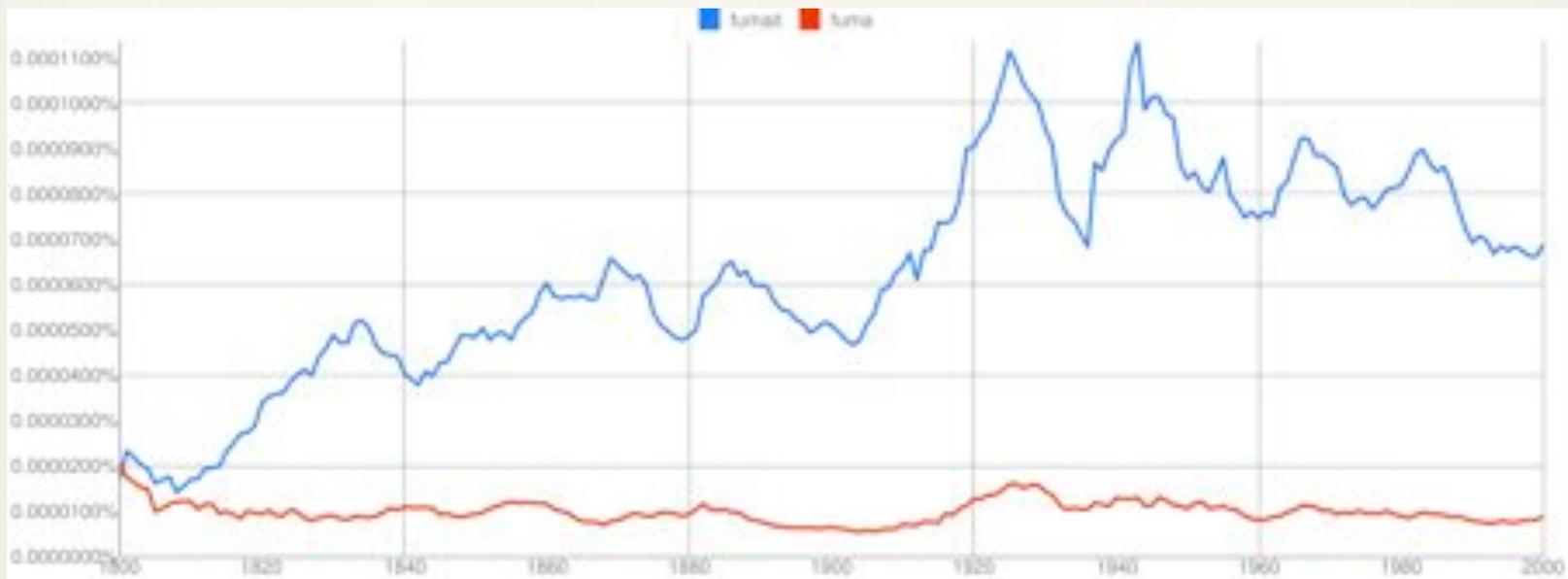
était vrai (blue) versus fut vrai (red)

Imparfait vs. Passé Simple



“aimait” (blue) versus “aima” (red)

Imparfait vs. Passé Simple



This example is already more difficult: "fumer" permits both a stative (habitual) and non-stative (eventive) reading.
l'imparfait (blue) versus "fuma" (red)

Temporal differences between states and non-states

- * Kamp & Reyle (1993) argue that states and non-states have different temporal consequences.
- * They look at the difference between
 1. Mary was ill last Sunday (state)
 2. Mary wrote a letter last Sunday (non-state)
- * What are the temporal possibilities?

Temporal differences between states and non-states

- ❖ Kamp & Reyle (1993) look at the differences between
 1. Mary was ill last Sunday (state, interval s)
 2. Mary wrote a letter last Sunday (non-state, interval e)
- ❖ What are the temporal possibilities?

Sunday

Temporal differences between states and non-states

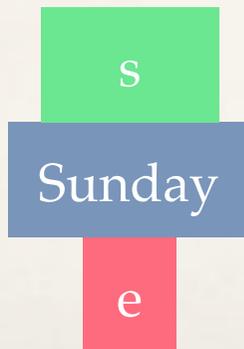
- ❖ Kamp & Reyle (1993) look at the differences between
 1. Mary was ill last Sunday (state, interval s)
 2. Mary wrote a letter last Sunday (non-state, interval e)
- ❖ What are the temporal possibilities?

Sunday

e

Temporal differences between states and non-states

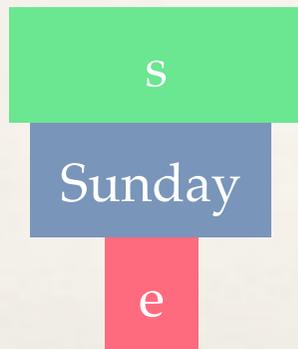
- ❖ Kamp & Reyle (1993) look at the differences between
 1. Mary was ill last Sunday (state, interval s)
 2. Mary wrote a letter last Sunday (non-state, interval e)
- ❖ What are the temporal possibilities?



Mary was ill last Sunday.
However, Saturday and Monday she was fine.

Temporal differences between states and non-states

- ❖ Kamp & Reyle (1993) look at the differences between
 1. Mary was ill last Sunday (state, interval s)
 2. Mary wrote a letter last Sunday (non-state, interval e)
- ❖ What are the temporal possibilities?

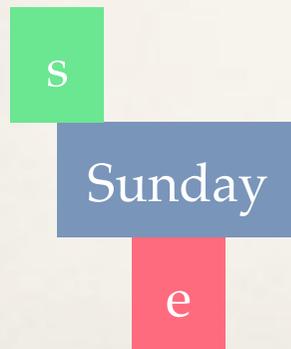


Mary was ill last Sunday.
In fact, she was ill the entire week.

Mary wrote a letter last Sunday.
In fact, it took her the entire week.

Temporal differences between states and non-states

- ❖ Kamp & Reyle (1993) look at the differences between
 1. Mary was ill last Sunday (state, interval s)
 2. Mary wrote a letter last Sunday (non-state, interval e)
- ❖ What are the temporal possibilities?

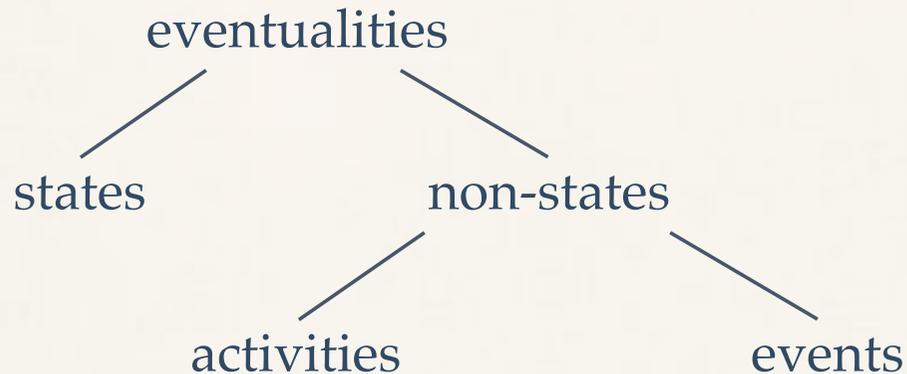


Kamp & Reyle conclude that states only need to *overlap* with the reference time, whereas events need to be *properly included* in the reference time.

States, non-states and the progressive

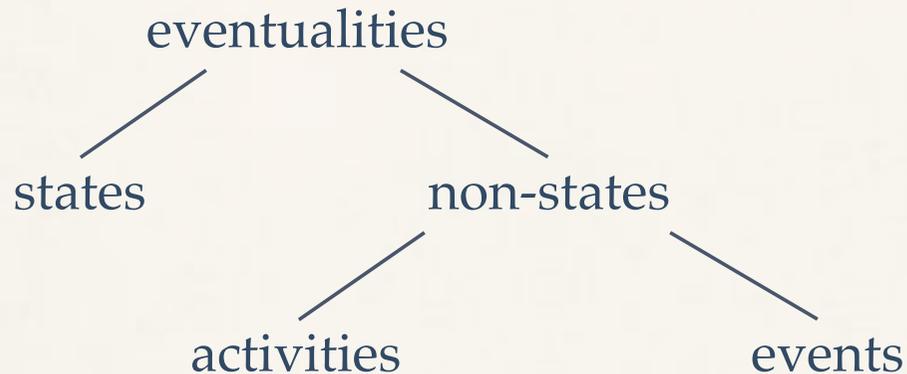
- ❖ There are some well-known exceptions of states which do permit a progressive
 1. John is an idiot.
 2. John is being an idiot.
- ❖ However, the interpretation of 1 and 2 is quite different: in sentence 1, the speaker considers “being an idiot” to be a more or less permanent characteristic of John, in sentence 2, it is John’s current behaviour which makes him an idiot, and therefore more easily “improved”

Splitting non-states



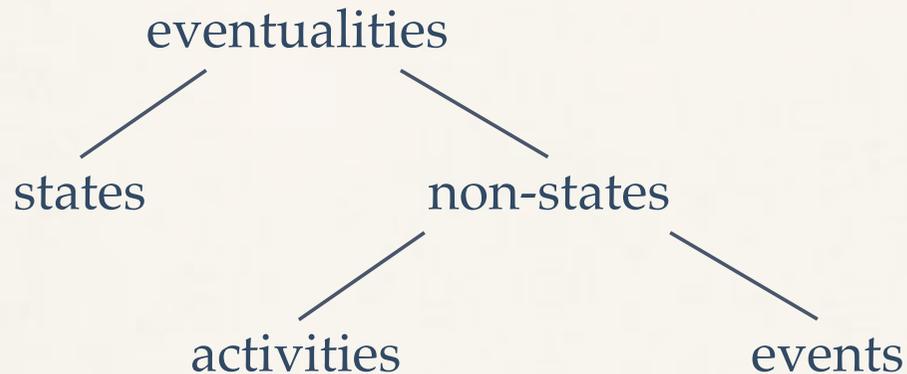
- The terminology between different sources is slightly different among authors.
- Many authors talk about “processes” instead of “activities”
- Pustejovsky (1991) uses “transitions” instead of “events”

Motivations for the “event” class



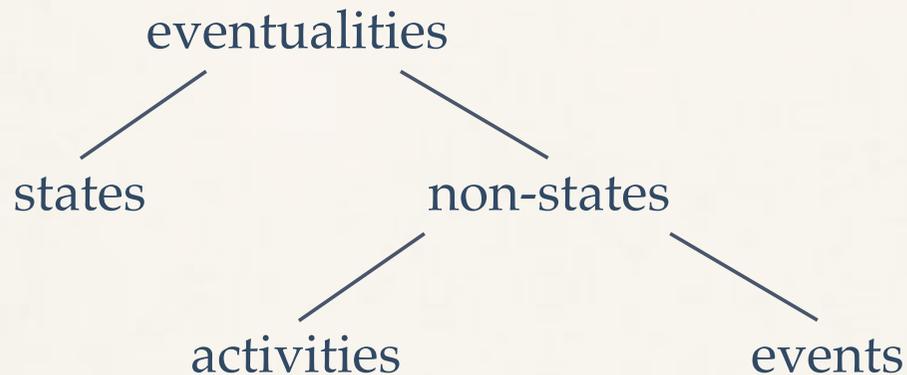
- What distinguishes events from states and activities is that they have a natural *endpoint*: events are (different authors use different terms here) *quantized, telic* or *terminative*, whereas states and activities are *homogeneous, atelic* or *durative*

Motivations for the “event” class



- Another important remark is that the event class is not just a property of the verb, but a property of the verb together with its arguments and modifiers: “John ran” is an activity (no termination), whereas “John ran to the store” (terminates at the store) and “John ran a mile” (terminates after a mile) are events.

Motivations for the “event” class



In French, the relevant modifiers are : “en une heure” (similar to “in an hour”) and “pendant une heure” (similar to “for an hour”).

Vendler also proposes “It took X an hour to” which behaves like “in an hour”

- The classic test Vendler proposes to distinguish events from the other classes is the “in an hour / for an hour” test: events accept “in an hour”, non-events accept “for an hour”.

Examples: “for an hour/day/year”

John was ill/loved Mary for a day	<input checked="" type="checkbox"/>
John ran/looked for a restaurant for an hour	<input checked="" type="checkbox"/>
#John ran a mile/built a house for an hour	<input type="checkbox"/>
#John reached the top/died for an hour	<input type="checkbox"/>

Dowty (1979) considers sentences like “John painted a picture for an hour” (compare with “John ran a mile for an hour” and “John built a house for an hour”) odd but not ungrammatical

Examples: “in an hour/day/year”

#John was ill/loved Mary in a day	<input type="checkbox"/>
#John ran/looked for a restaurant in an hour	<input type="checkbox"/>
John ran a mile/built a house in an hour/a year	<input checked="" type="checkbox"/>
John reached the top/died in an hour	<input checked="" type="checkbox"/>

In an hour/for an hour

Similar examples are

1. John played the sonata in five minutes.
2. John played the sonata for five hours.

- 1) John ran around the house in twenty minutes.
- 2) John ran around the house for two hours.

- * Some VPs, such as “run around the house” accept both “in” and “for” adverbials.
- * However, the interpretation is different: in 1, it took John twenty minutes to make a single tour around the house, whereas in 2, the prominent interpretation is that he made several tours around the house. This is another case of coercion.

Subdividing the three classes in two different ways

"homogeneous" is a term used by Vendler in the same sense as well.

homogeneous		quantized
states	activities	events
stative	dynamic	

"quantized" is introduced by Krifa; Vendler, on the other hand, speaks of "[eventualities] which proceed toward a terminus which is logically necessary to their being what they are"

- de Swart & Verkuyl (1999) regroup the three categories as follows: besides the states and (dynamic) non-states, they distinguish between *homogeneous* and *quantized* eventualities
- homogeneous eventualities (like "is ill" or "walks") have the property that "sub-eventualities" satisfy the same predicate and that "sums" satisfy the same predicate

Subdividing the three classes in two different ways

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- According to de Swart (1998), the French *imparfait* requires the eventuality to be homogeneous (as opposed to non-stative), whereas the French *passé simple* requires the eventuality to be quantized.
- As we will see later, mismatches can be accounted for by various means of coercion.

Subdividing the three classes in two different ways

homogeneous		quantized
states	activities	events
stative	dynamic	

quantized

run a mile

run a mile

homogeneous

be ill

be ill

Subdividing the three classes in two different ways

homogeneous		quantized
states	activities	events
stative	dynamic	

quantized

run two miles
be ill

homogeneous

Similarly, "reach the top/
win" becomes "reach the
top/win *twice*",
whereas "run" stays
"run" "read books" stays
"read books"

Subdividing the three classes in two different ways

homogeneous		quantized
states	activities	events
stative	dynamic	

quantized

run a mile
be ill

homogeneous

Subdividing the three classes in two different ways

homogeneous		quantized
states	activities	events
stative	dynamic	

quantized

run a mile

run ½ mile

homogeneous

be ill

be ill

Similarly: "reach the top" become "reaching towards the top" but "run" stays "run"

Note that this hold up until the (hard to define!) "atomic subevents", ie. moving a leg does not count as running, waltzing requires at least three steps, and it doesn't shock us if someone says he has been "reading for two hours" if he visited the bathroom for two minutes and drank a glass of water in three 20-second periods.

Subdividing the three classes in two different ways

homogeneous		quantized
states	activities	events
stative	dynamic	

- so we can claim that “for an hour” transforms a homogeneous/atelic eventuality into a quantized/telic one (much like the progressive transforms dynamic into stative)

However, this is because “an hour” is a definite period of time: compare with the indefinite “for hours”, which does not transform into a telic/durative eventuality

The “imperfective paradox” (Dowty 1979)

1a) John is sleeping

1b) John has slept

2a) John is running

2b) John has run

3a) John is falling asleep

3b) John has fallen asleep

4a) John is dying

4b) John has died

- * From 1a we can conclude 1b and from 2a we can conclude 2b
- * On the other hand, from 3a we *cannot* conclude 3b and from 4a we *cannot* conclude 4b

The “imperfective paradox”

1a) John is sleeping

1b) John has slept

2a) John is running

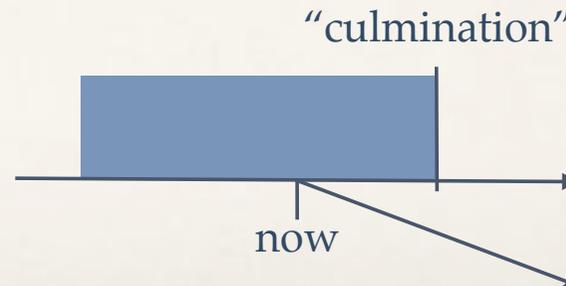
2b) John has run

3a) John is falling asleep

3b) John has fallen asleep

4a) John is dying

4b) John has died

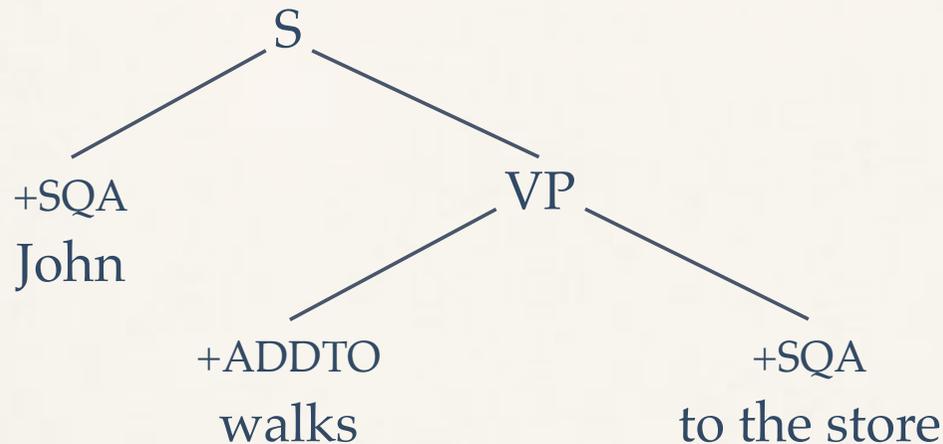


Examples: “is *X*ing implies has *X*ed”

---	d.n.a
John was running / looking for a restaurant	<input checked="" type="checkbox"/>
John was running a mile / building a house	<input type="checkbox"/>
John was (?)reaching the top / dying	<input type="checkbox"/>

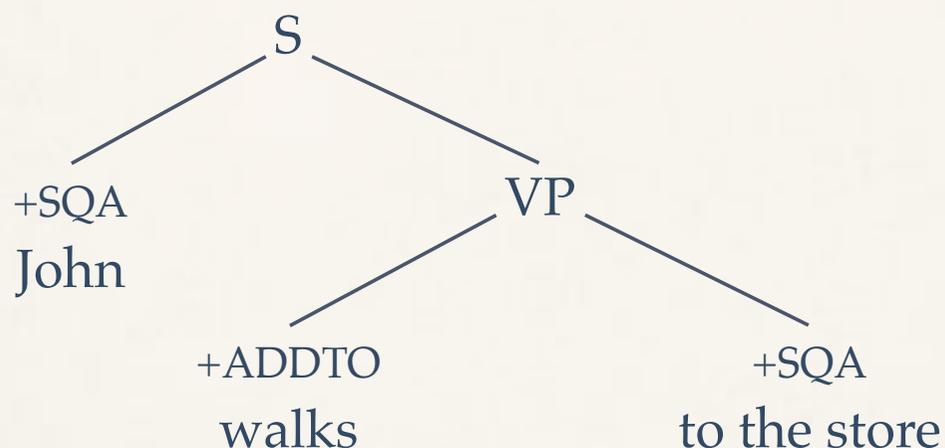
Dowty (1979) notes that many achievements (other than “to die”) are quite bad in the progressive.

Verkuyl's (1993) analysis of the three classes



- according to Verkuyl, verbs are lexically marked as being either stative (-ADDTO) or non-stative / dynamic (+ADDTO)
- arguments are marked as denoting a specified quantity (+SQA) or not (-SQA)

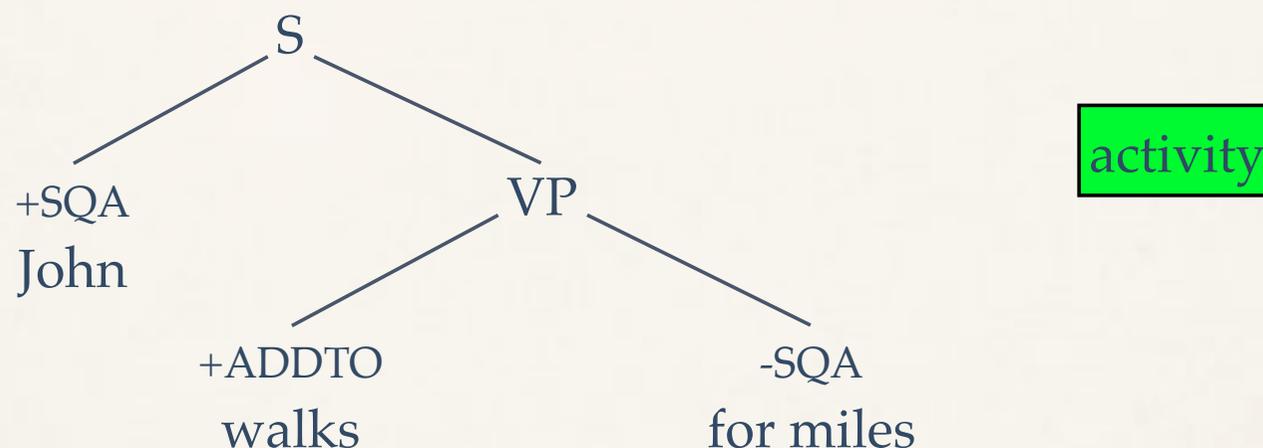
Verkuyl's (1993) analysis of the three classes



event

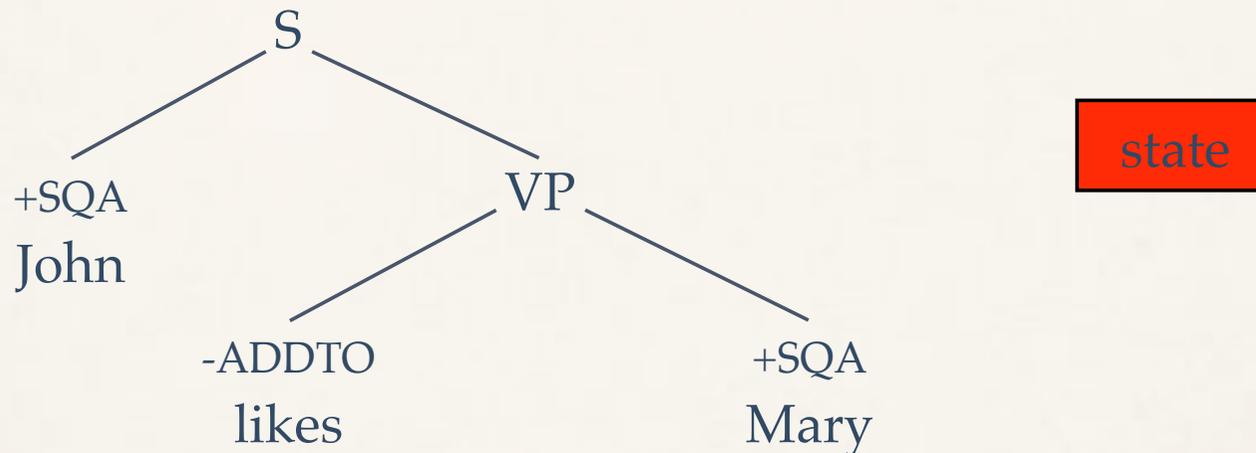
- The combination of a non-stative / dynamic (+ADDTO) verb with only specified quantity (+SQA) arguments gives an *event*

Verkuyl's (1993) analysis of the three classes



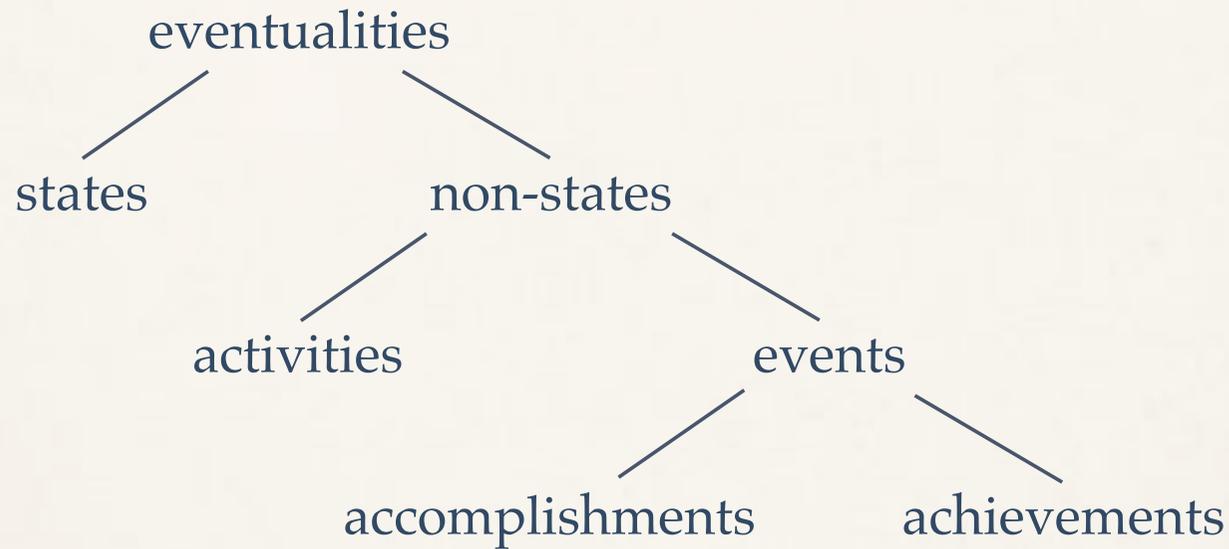
- The combination of a non-stative / dynamic (+ADDTO) verb with at least one unspecified quantity (-SQA) arguments gives an *activity*

Verkuyl's (1993) analysis of the three classes



- The combination of a stative (-ADDTO) verb with any combination of arguments gives a state (note that the correspondance with Vendler is not as precise as it seems: some verbs, like “chew” are -ADDTO but correspond IMHO to *activities* in Vendler’s classification).

Vendler's four categories



Vendler's four categories

- * “Accomplishments imply the notion of unique and definite time *periods* (ie. are quantized / telic RM) [...] while achievements involve unique and definite time *instants*” Vendler (1967), my italics.
- * if I write a letter (ie. an *accomplishment* RM) in an hour, then I can say “I am writing a letter” at any time during that hour; but if it takes three hours to reach the top (ie. an *achievement* RM), I cannot say “I am reaching the top” at any moment of that period.

Vendler's classification of his four categories

	Process strange in progressive	No process accepts progressive
Not definite, atelic accepts "for an hour"	State eg. likes music, is tired	Activity eg. watch TV, walk
Definite, telic accepts "in an hour"	Achievement eg. won the race, found the treasure	Accomplishment eg. write a letter, walk to the store

Krifka uses the term "quantized" for telic (and, following Bach (1986), applies it to the nominal domain as well).

Smith's classification of Vendler's four categories

	Telic	Dynamic	Durative
State	-	-	+
Activity	-	+	+
Accomplishment	+	+	+
Achievement	+	+	-

Examples of the four classes

John was ill, John loved Mary

state

John ran, John looked for a restaurant

activity

John ran a mile, John built a house

achievement

John reached the top, John died

accomplishment

Linguistic tests for the four classes

- * Now that we have distinguished between states, activities, achievements and accomplishment, let's look at some further linguistic / semantic tests which we can use to distinguish between the different classes.
- * Dowty (1979) discusses these test in detail and we will finish with his table summarizing the different diagnostics.

Habitual interpretation in the present tense

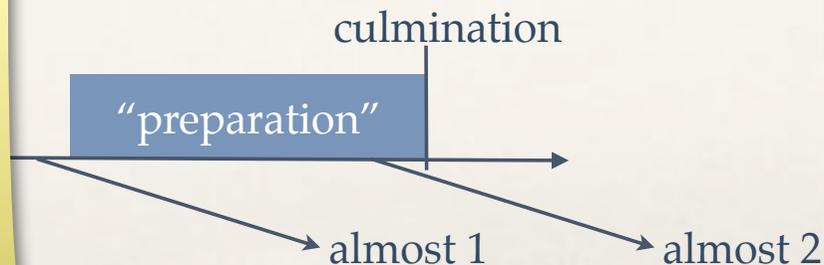
John is ill, John loves Mary	no
John runs, Kasparov plays chess	yes
John walks to work	yes
John wins at poker	yes

English has the peculiarity that the present tense is acceptable only for states ("narrative present" uses, such as stage directions, sports reports and newspaper headlines are notable exceptions). This means that when a non-stative verb occurs in the present tense, a coercion needs to occur (more on this later) and one of the possible coercions is to a "habitual state"

Ambiguity with “almost”

John was almost ill, John almost loved Mary	state
John almost ran, John almost looked for a restaurant	activity
John almost ran a mile, John almost built a house	achievement
John almost reached the top, John almost died	accomplishment

for states and activities, the culmination point is absent (or alternatively the predicate p is already true, so “almost p” is incoherent), so “almost 2” is excluded.
for accomplishments, the “preparation phase” is absent, therefore it is impossible to distinguish “almost 1” and “almost 2”



Complement of “stop”

(?)John stopped being ill, John stopped loving Mary

state

John stopped running, John stopped looking for a restaurant

activity

John stopped running a mile, John stopped building a house

achievement

?John stopped reaching the top, ?John stopped dying

accomplishment

Complement of “finish”

?John finished being ill, ?John finished loving Mary

state

?John finished running, ?John finished looking for a restaurant

activity

John finished running a mile, John finished building a house

achievement

?John finished reaching the top, ?John finished dying

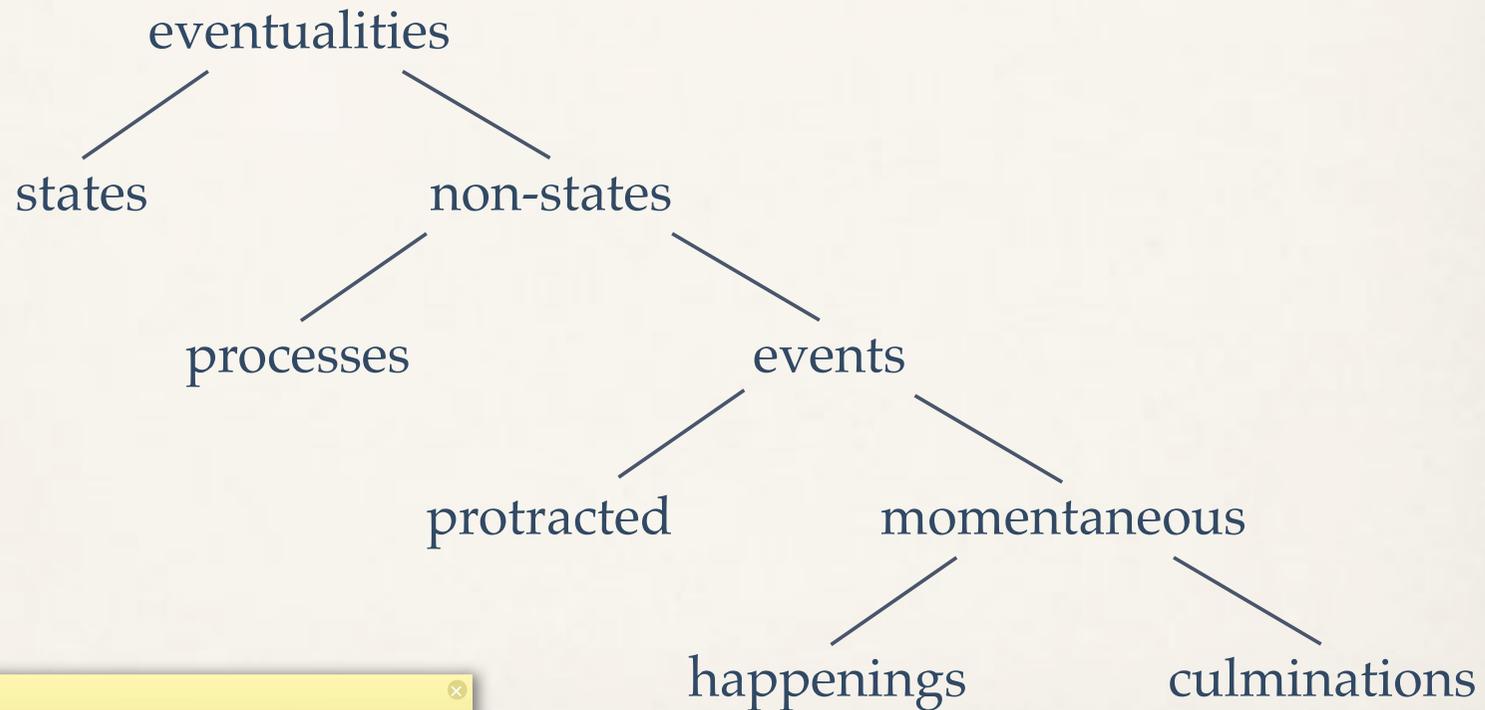
accomplishment

Dowty's (1979) table of diagnostics for the Vendler classes

Note that Dowty accepts "John built a house for an hour" but Vendler doesn't

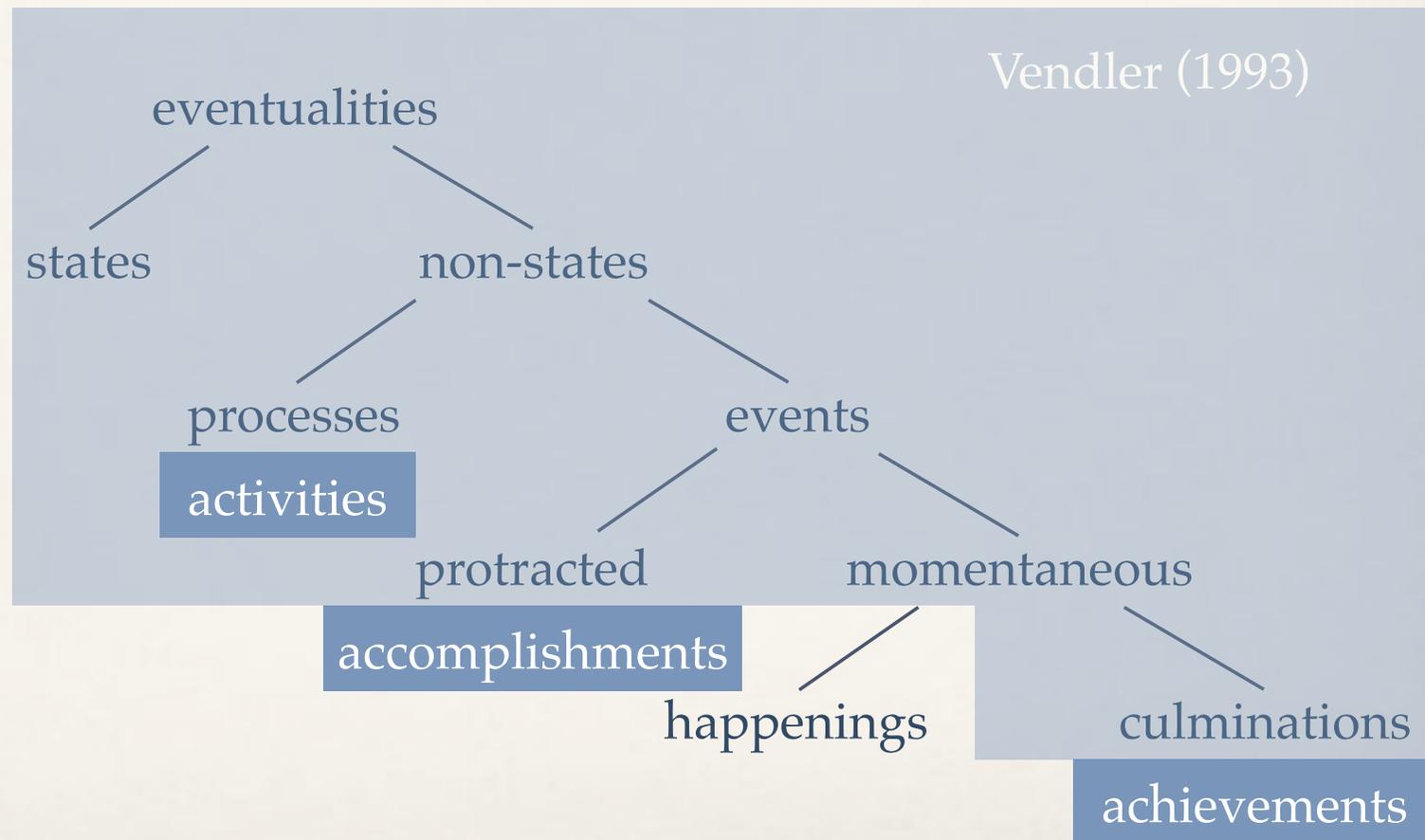
	State	Activ	Acco	Achv
meets non-stative tests	no	yes	yes	?
habitual interpretation in present	no	yes	yes	yes
"for an hour"	OK	OK	OK	bad
<i>V</i> for an hour implies <i>V</i> during this hour	yes	yes	no	DNA
"in an hour"	bad	bad	OK	OK
<i>x V</i> ed in an hour implies <i>x</i> was <i>V</i> ing	DNA	DNA	yes	no
<i>x</i> is <i>V</i> ing implies <i>x</i> has <i>V</i> ed	yes	yes	no	DNA
complement of <i>stop</i>	OK	OK	OK	bad
complement of <i>finish</i>	bad	bad	OK	bad
ambiguity with <i>almost</i>	no	no	yes	no
occurs with <i>attentively, carefully</i>	bad	OK	OK	bad

The Algebra of Events (Bach 1986)

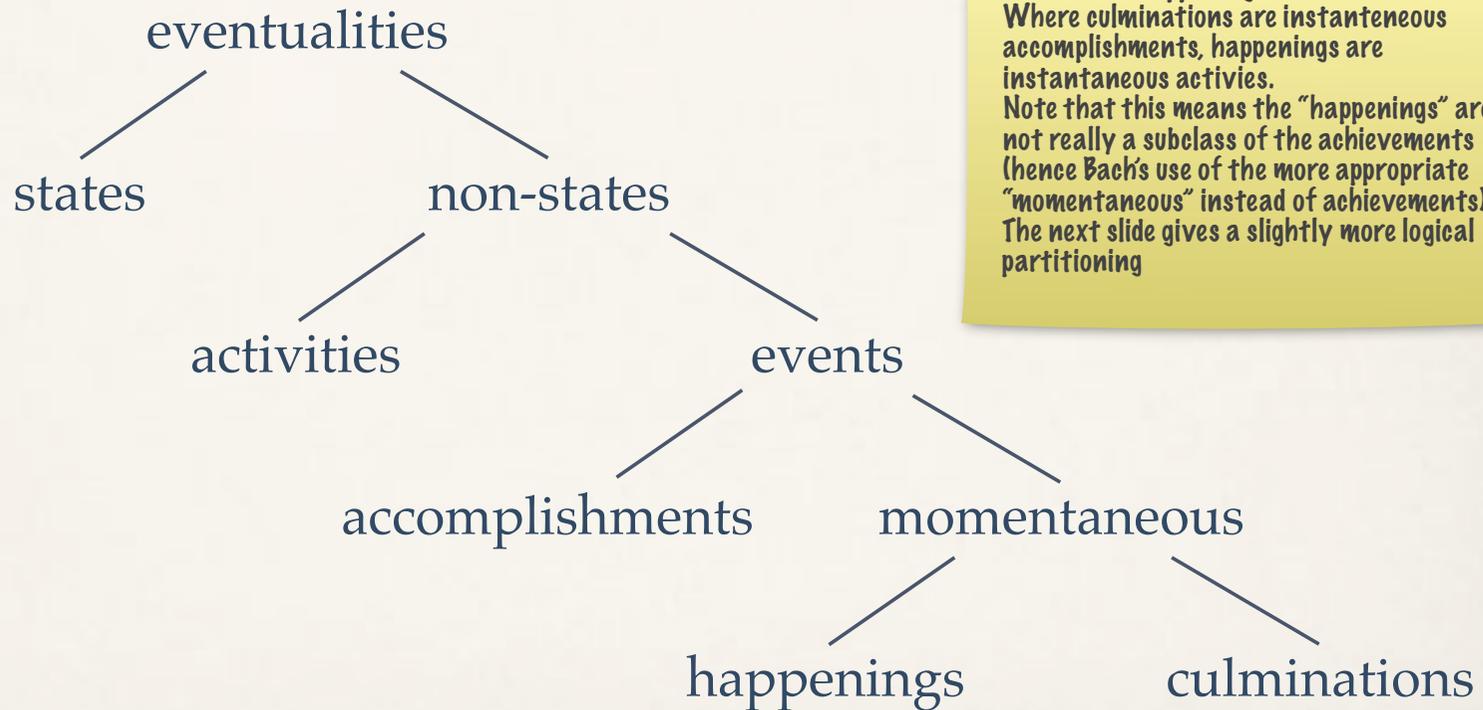


Bach subdivides states into dynamic ("stand", "sit") and static states ("be drunk", "be in New York") as well, we will not talk about this here

The Algebra of Events (Bach 1986)

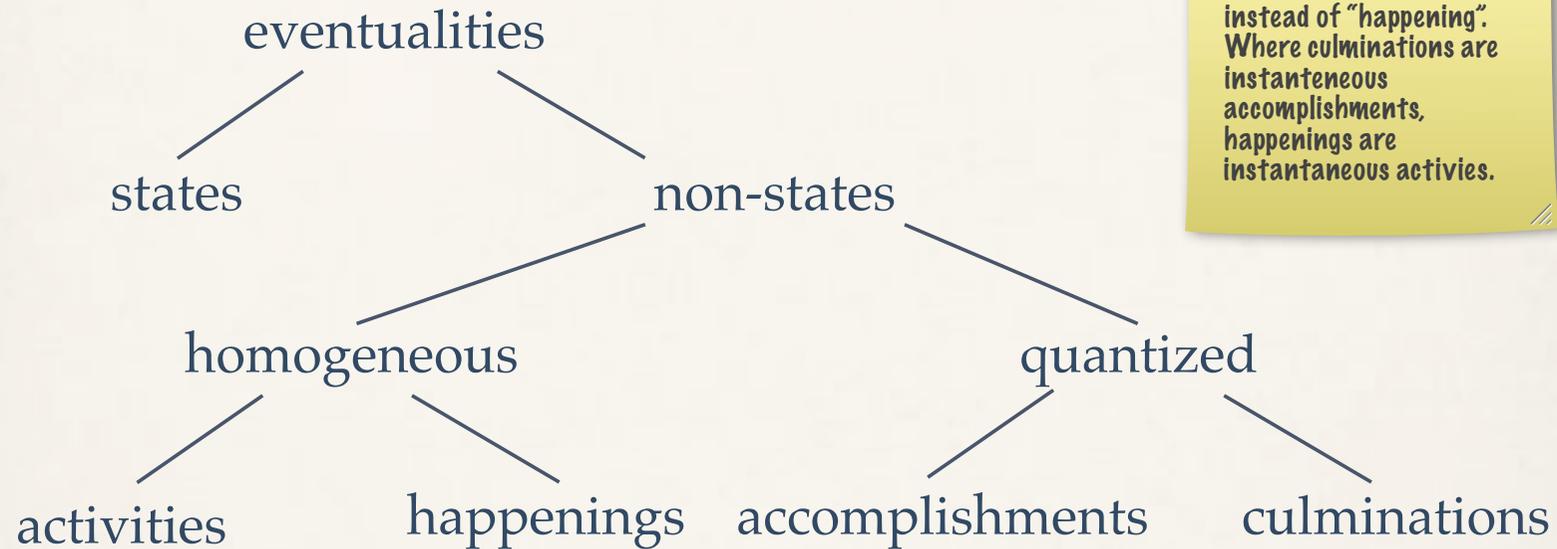


The Algebra of Events (Bach 1986)



Some authors use the word "semelfactive" instead of "happening". Where culminations are instantaneous accomplishments, happenings are instantaneous activities. Note that this means the "happenings" are not really a subclass of the achievements (hence Bach's use of the more appropriate "momentaneous" instead of achievements). The next slide gives a slightly more logical partitioning

Another partitioning of the five classes

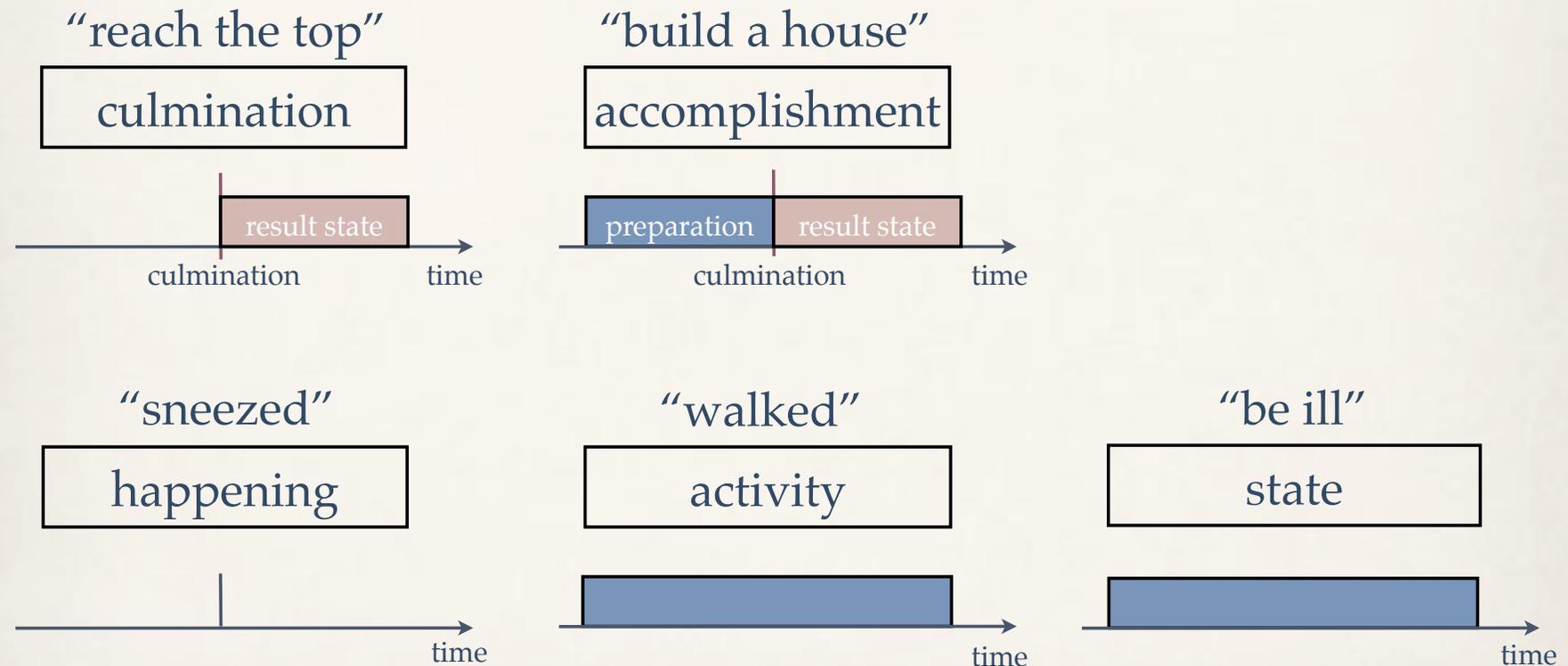


Some authors use the word "semelfactive" instead of "happening". Where culminations are instanteneous accomplishments, happenings are instantaneous activies.

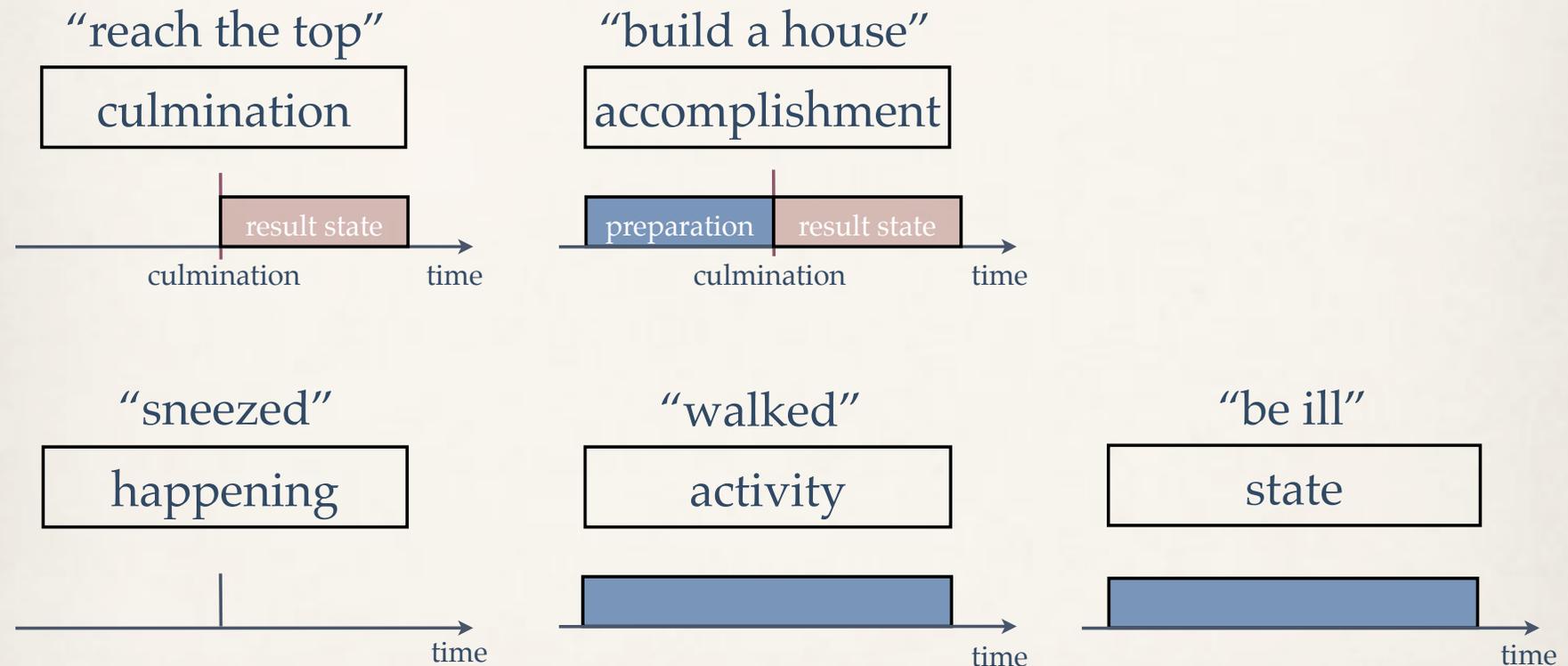
Moens & Steedman (1988)

	non-states		states
	atomic	extended	
State change	culmination eg. win the race	accomplishment eg. build a house	eg. understand, love, know, resemble
No state change	happening eg. hiccup, blink	activity eg. play the piano	

Moens & Steedman (1988)

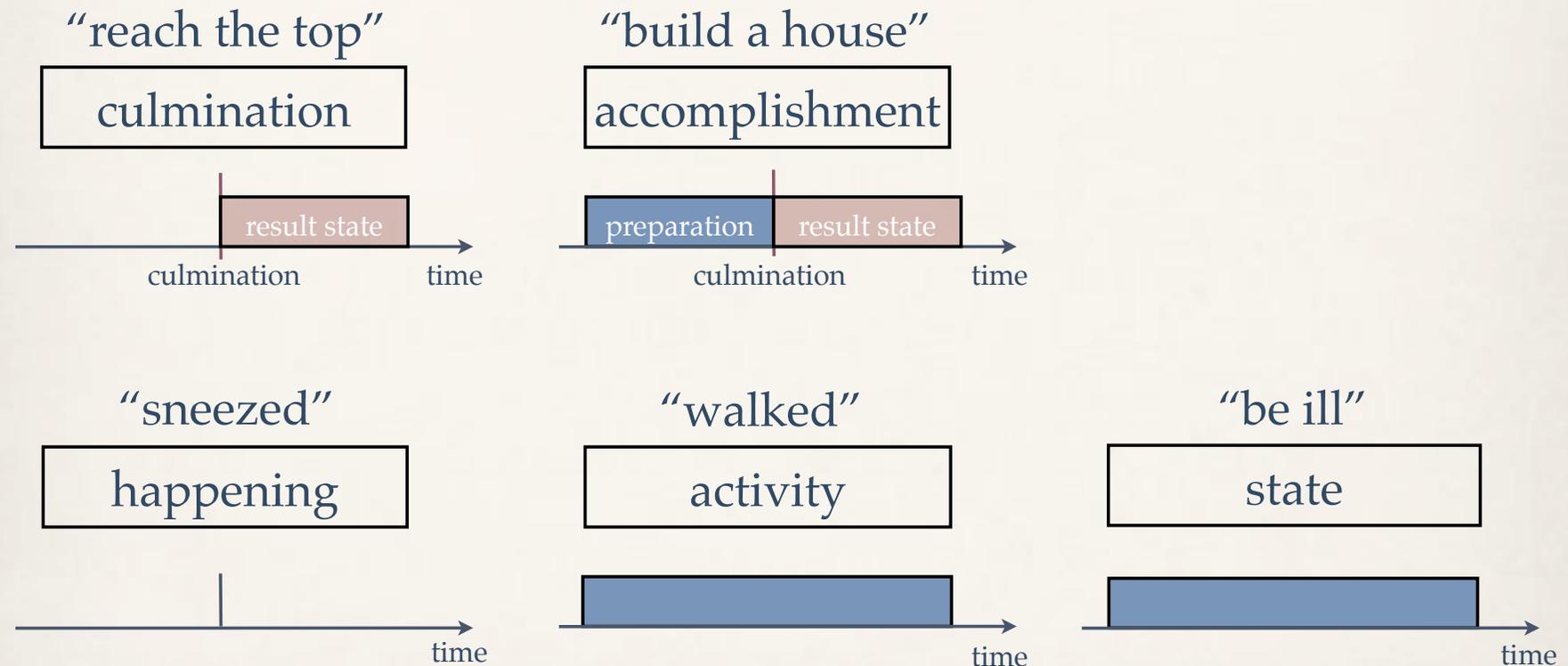


Moens & Steedman (1988)



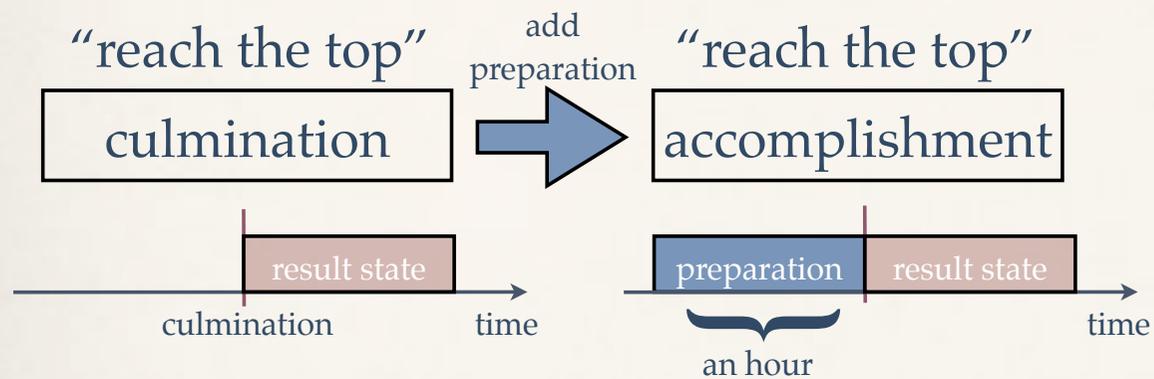
#John sneezed in an hour
John sneezed for an hour

Moens & Steedman (1988)



John reached the top in an hour
#John reached the top for an hour

Moens & Steedman (1988)



“in an hour” applies only to accomplishments, but we can coerce a culmination into an accomplishment by taking the preparatory process into account

John reached the top in an hour
#John reached the top for an hour

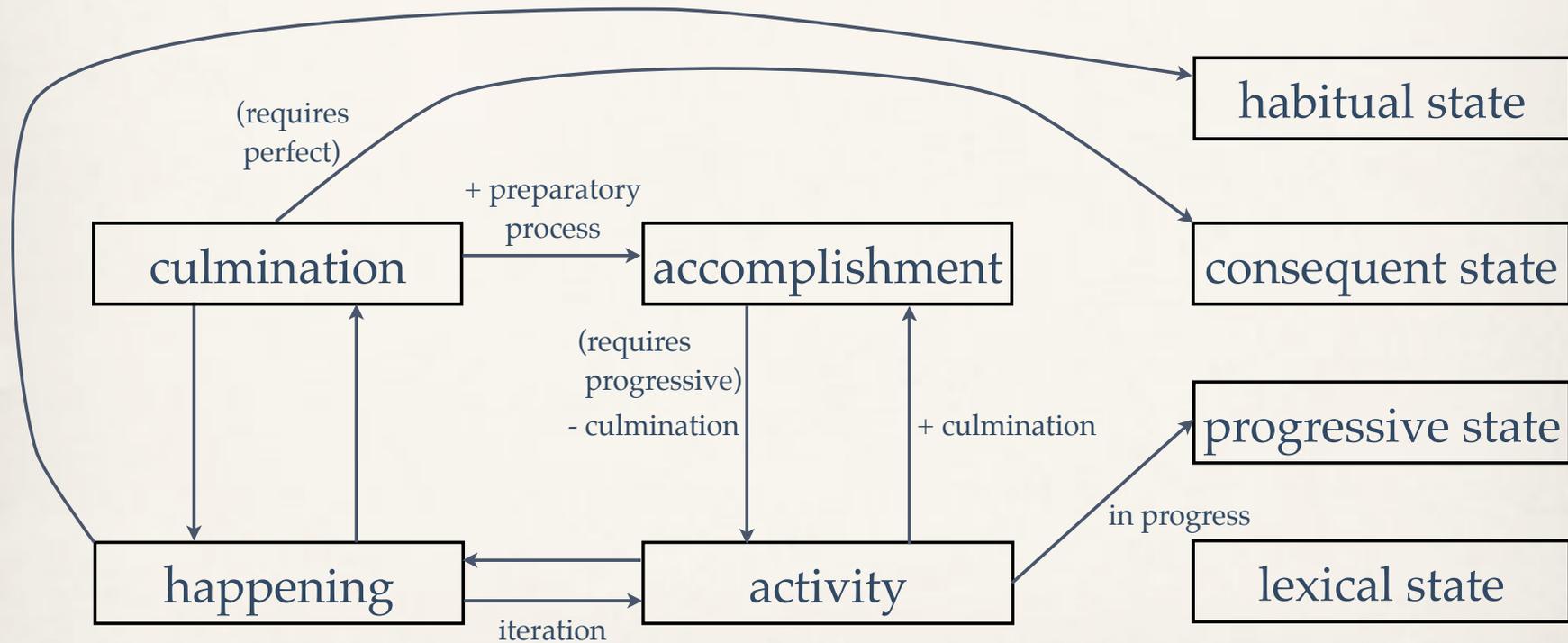
Moens & Steedman (1988)



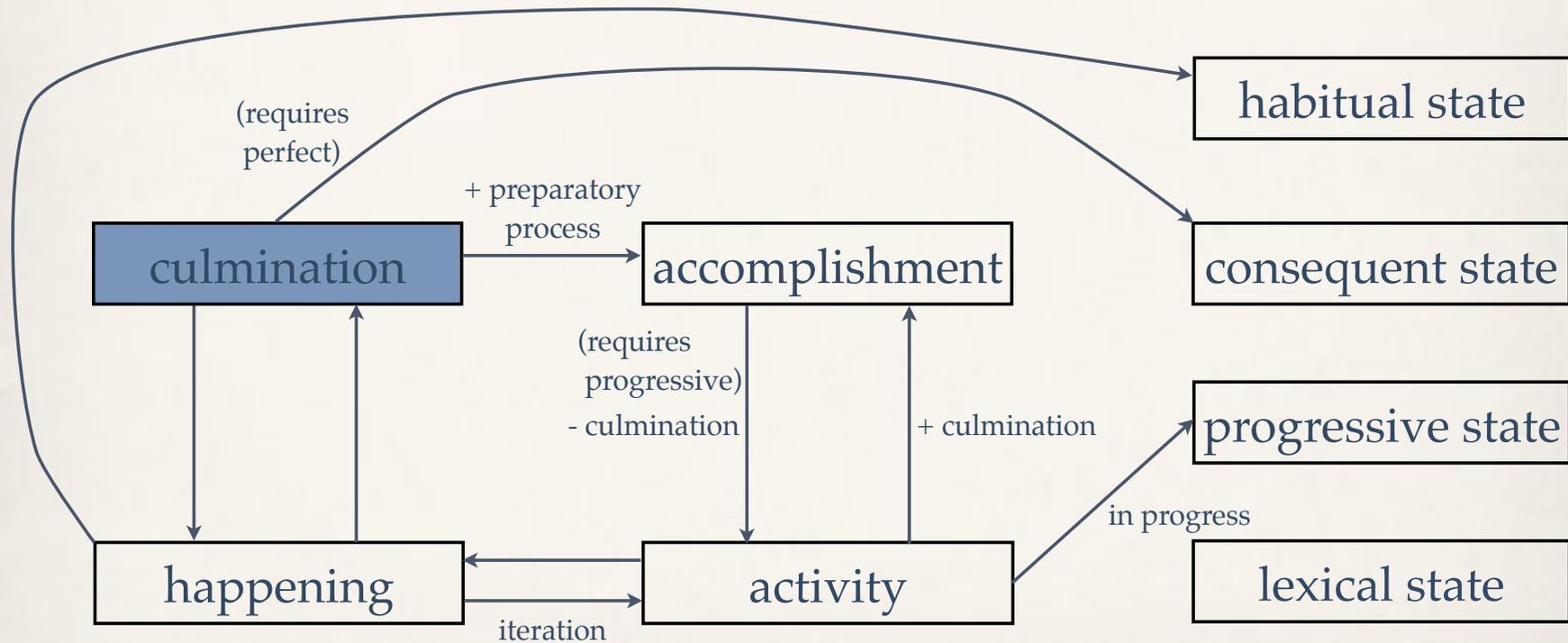
“for an hour” applies only to activities (having the effect of adding a culmination point), but we can coerce a happening into an activity by iterating it

#John sneezed in an hour
John sneezed for an hour

Moens & Steedman (1988)

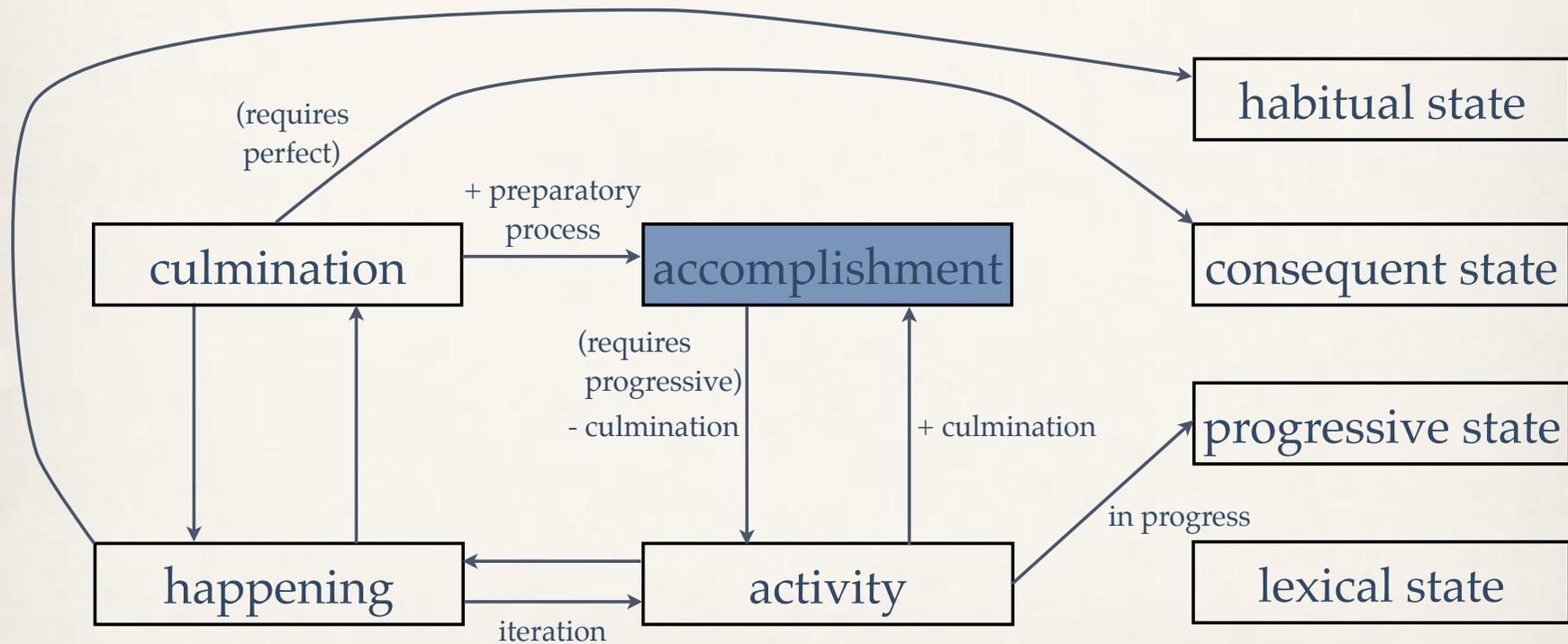


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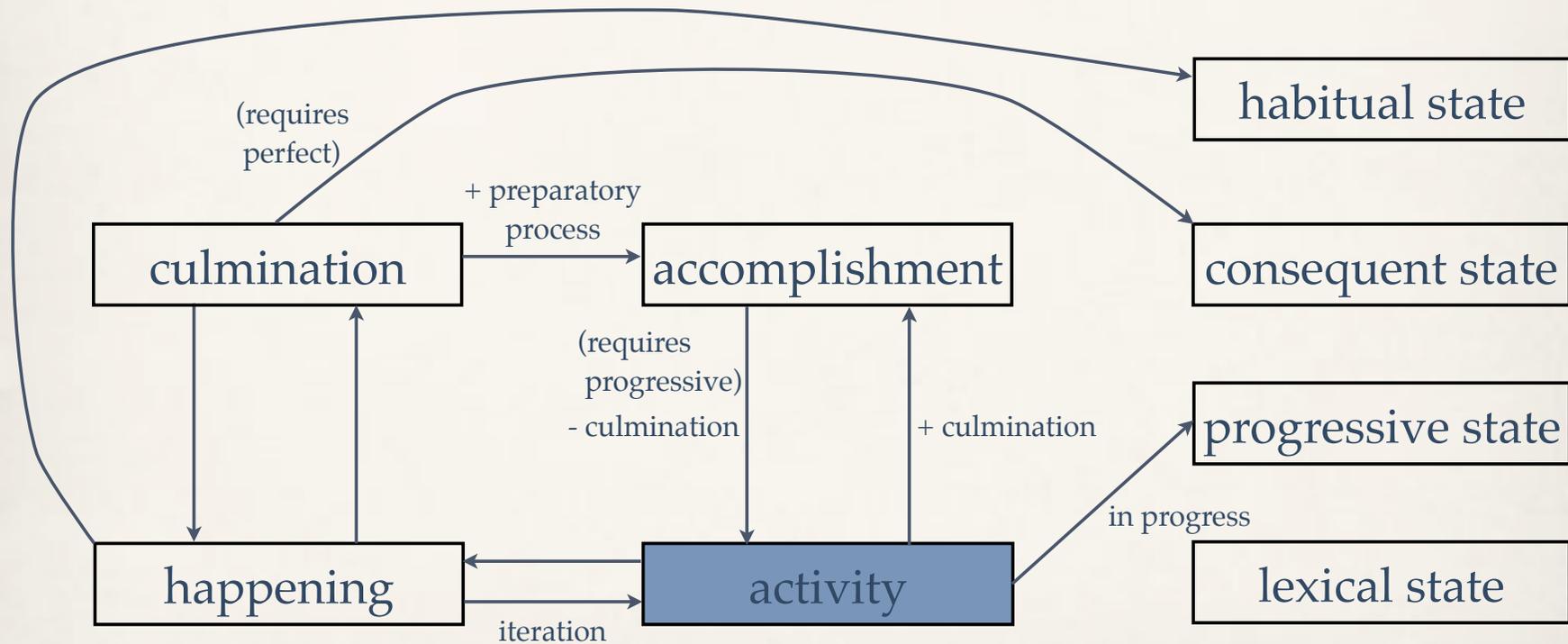
John die

Moens & Steedman (1988)



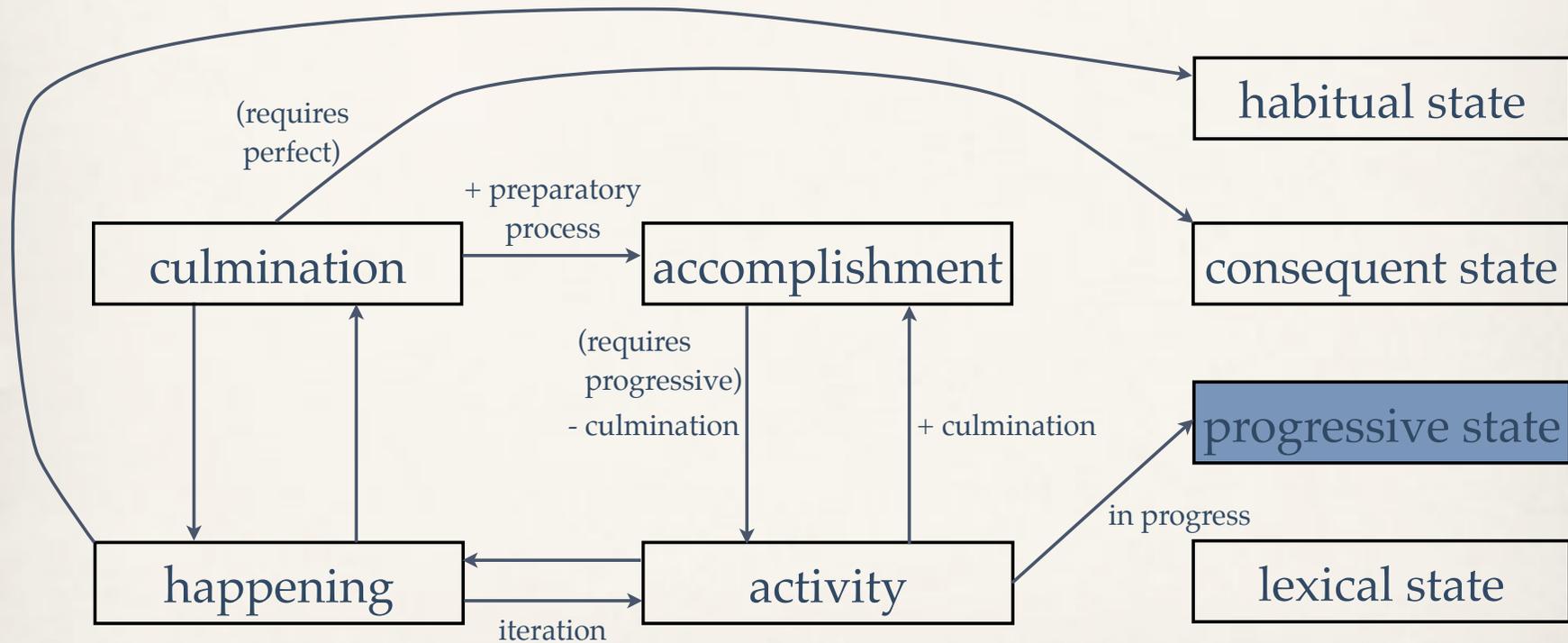
John die

Moens & Steedman (1988)



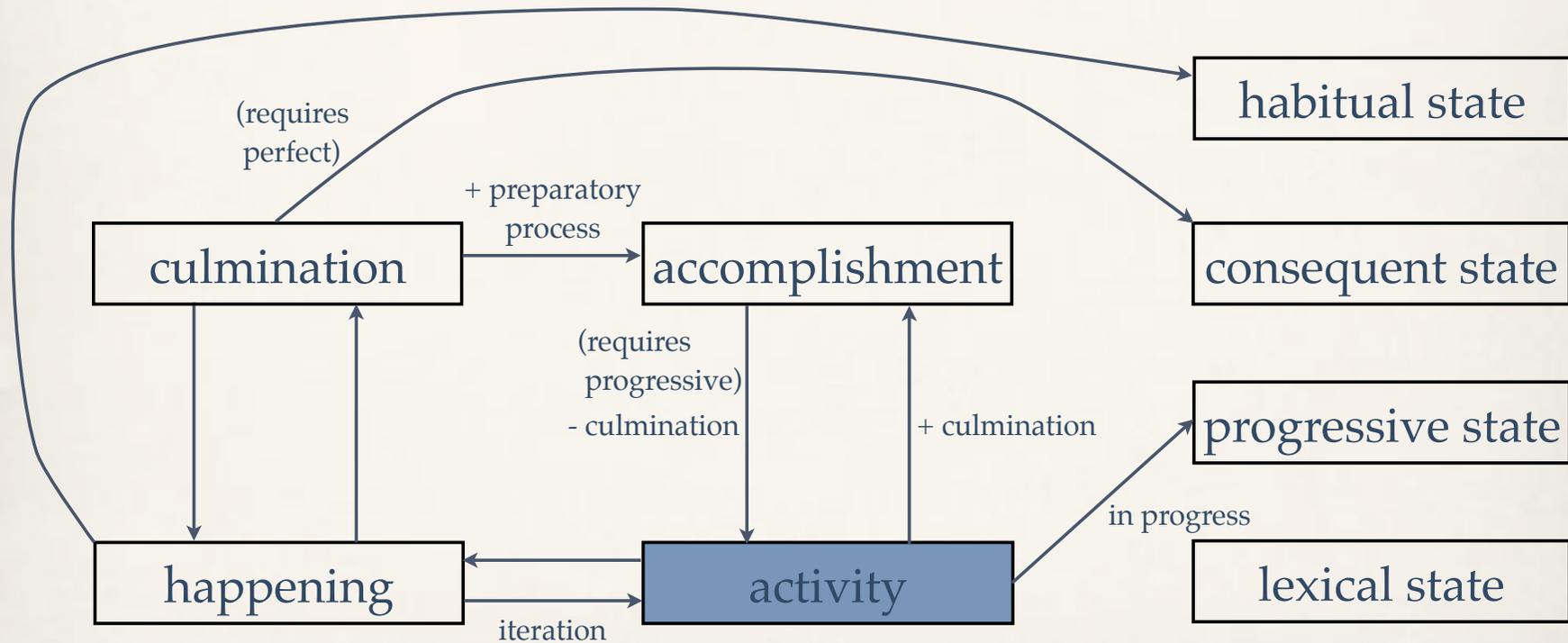
John is dying

Moens & Steedman (1988)



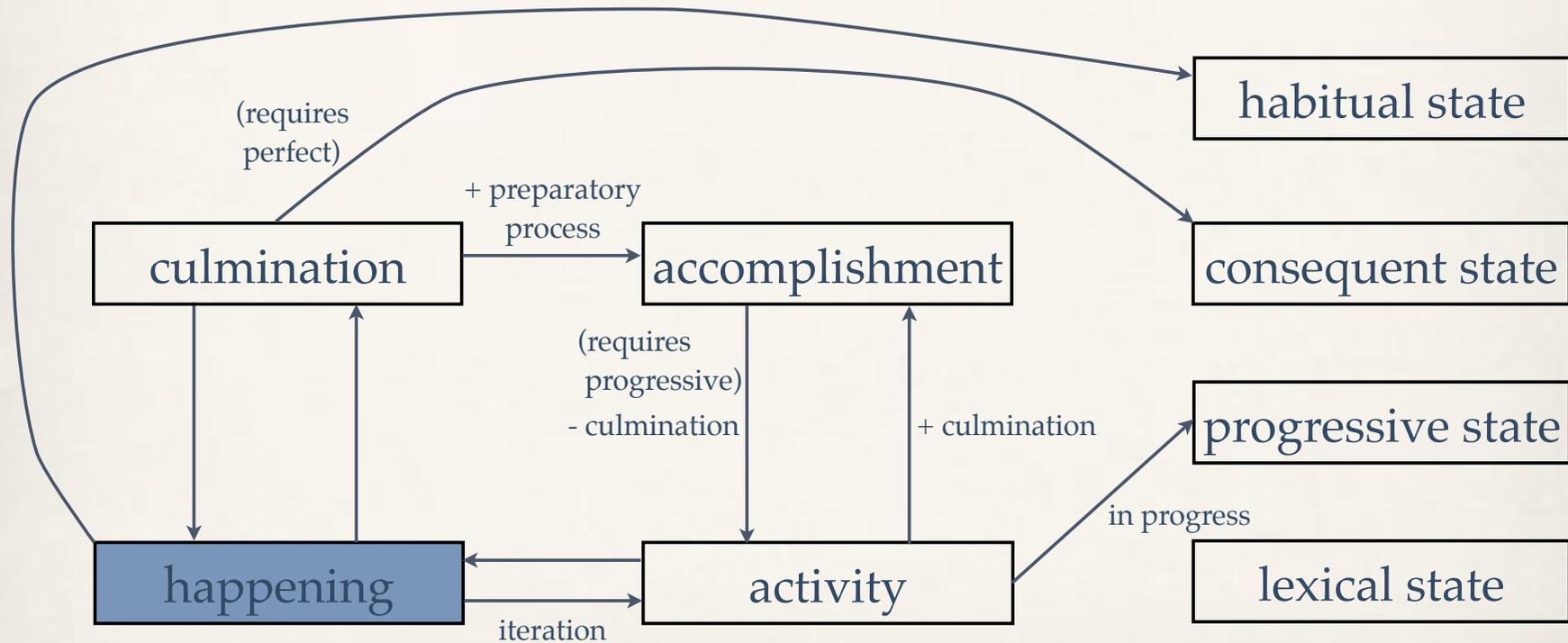
John is dying

Moens & Steedman (1988)



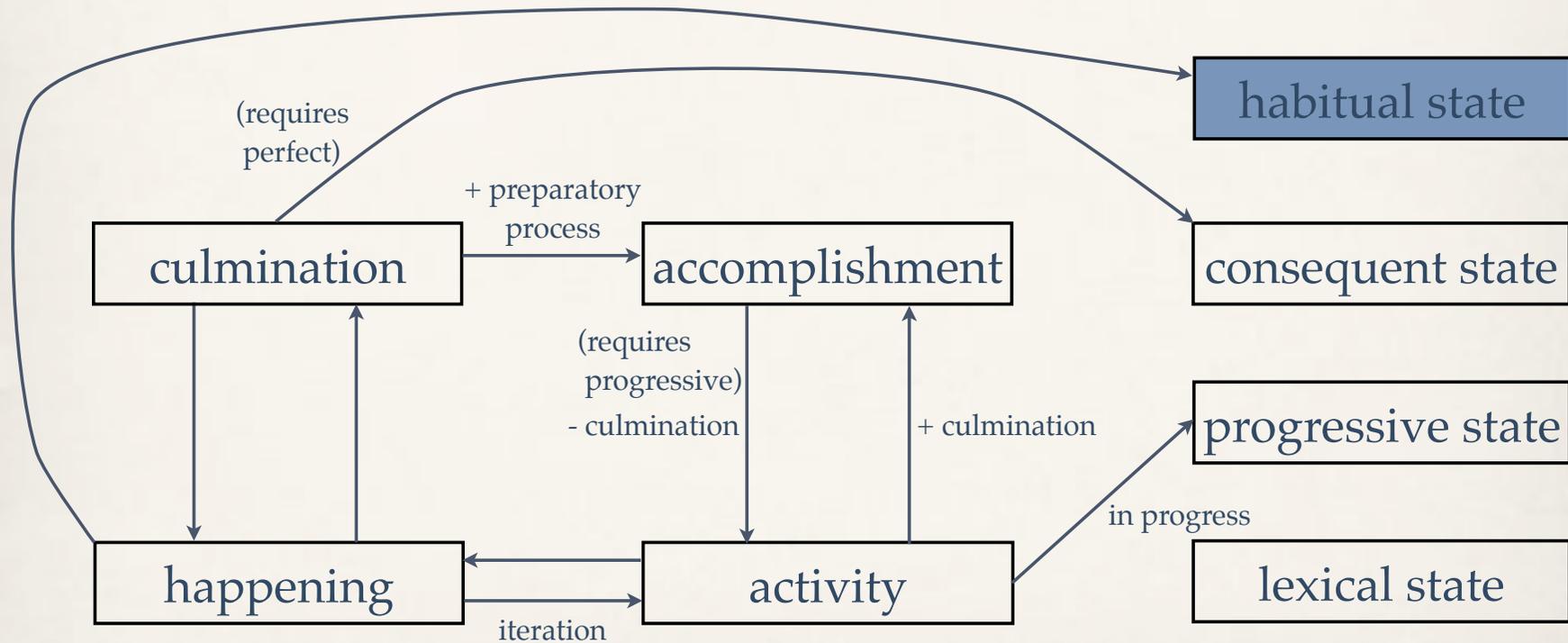
Kasparov plays chess

Moens & Steedman (1988)



Kasparov plays chess

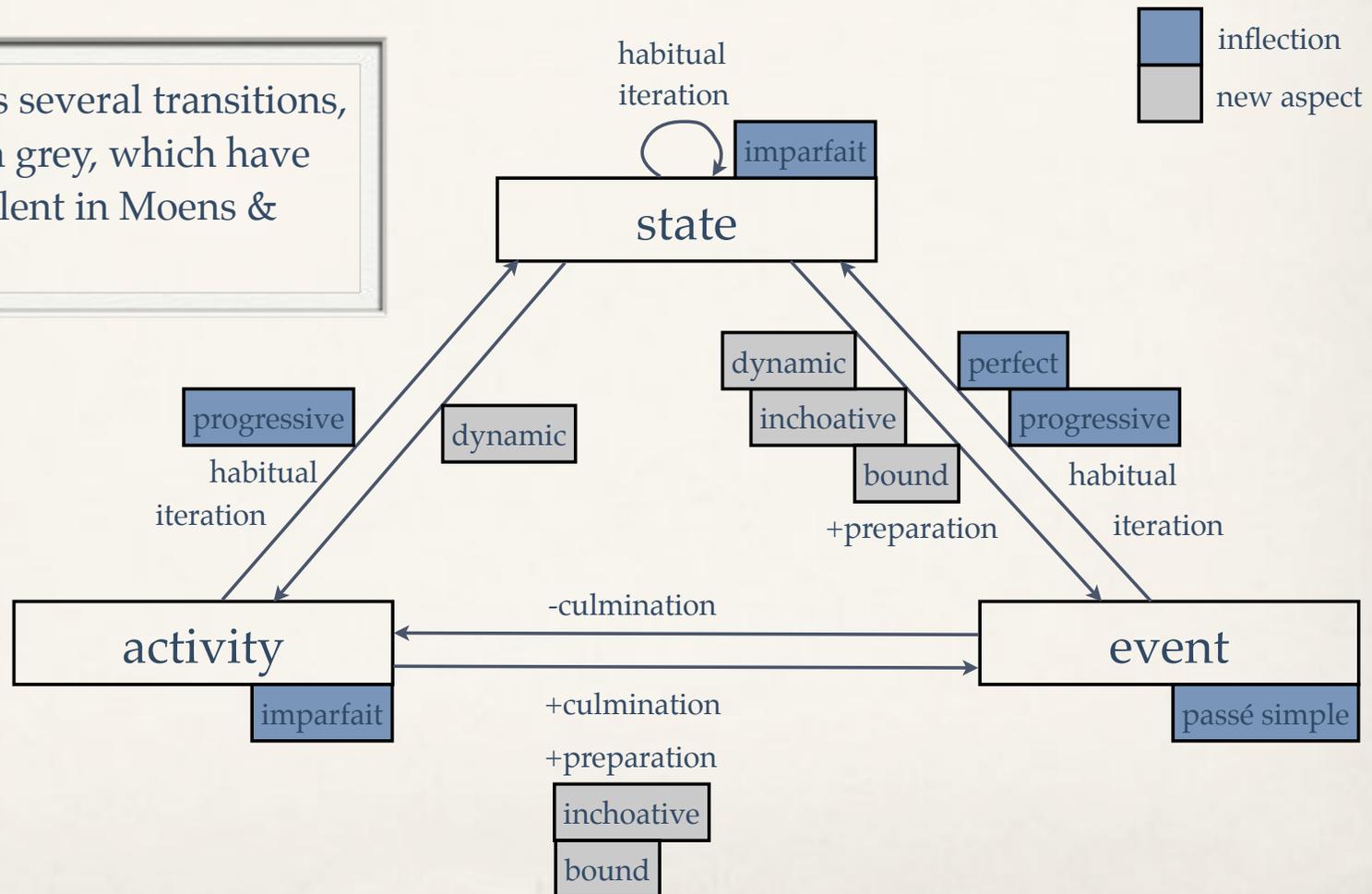
Moens & Steedman (1988)



Kasparov plays chess

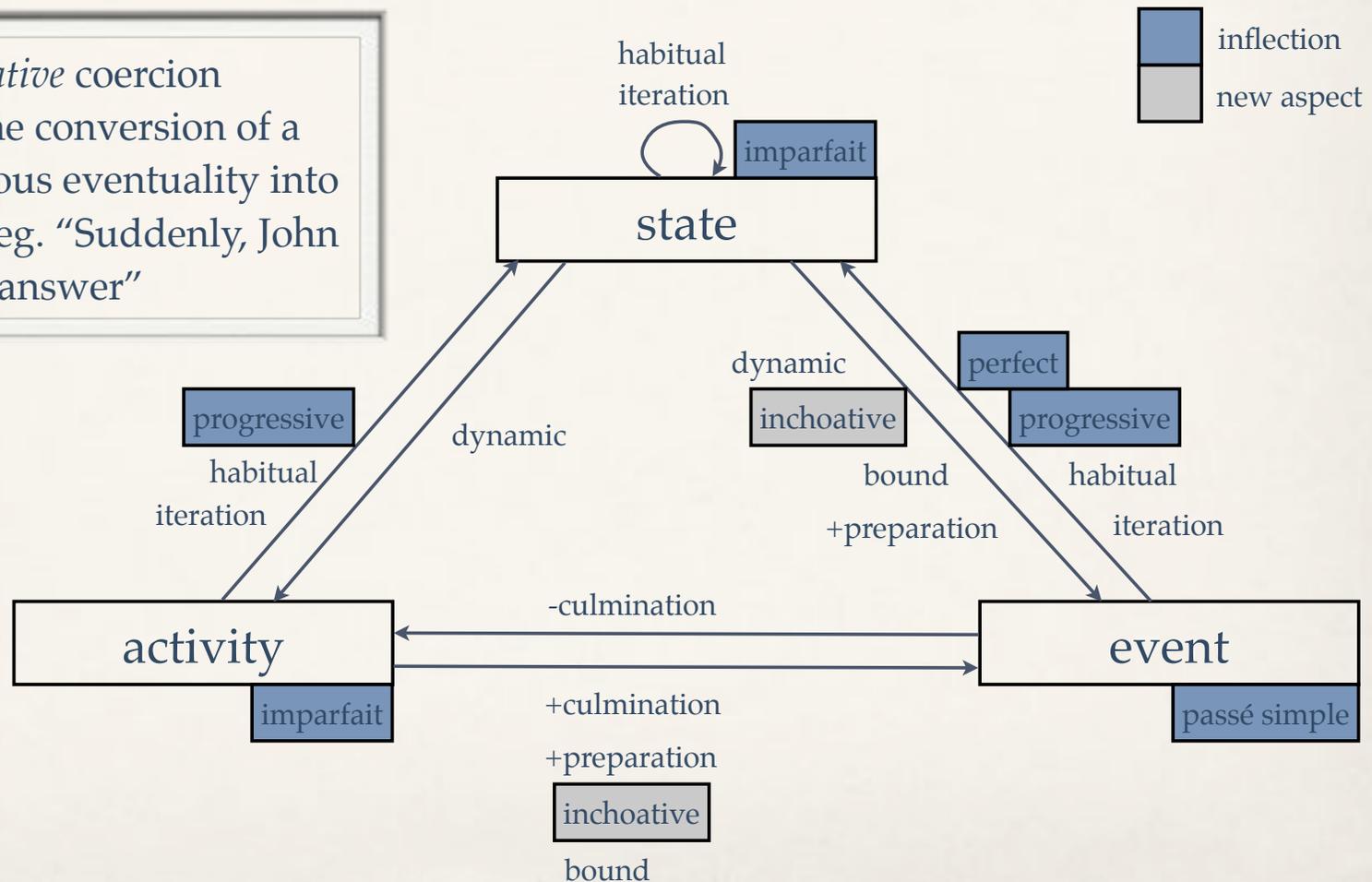
de Swart (1998)

It includes several transitions, marked in grey, which have no equivalent in Moens & Steedman



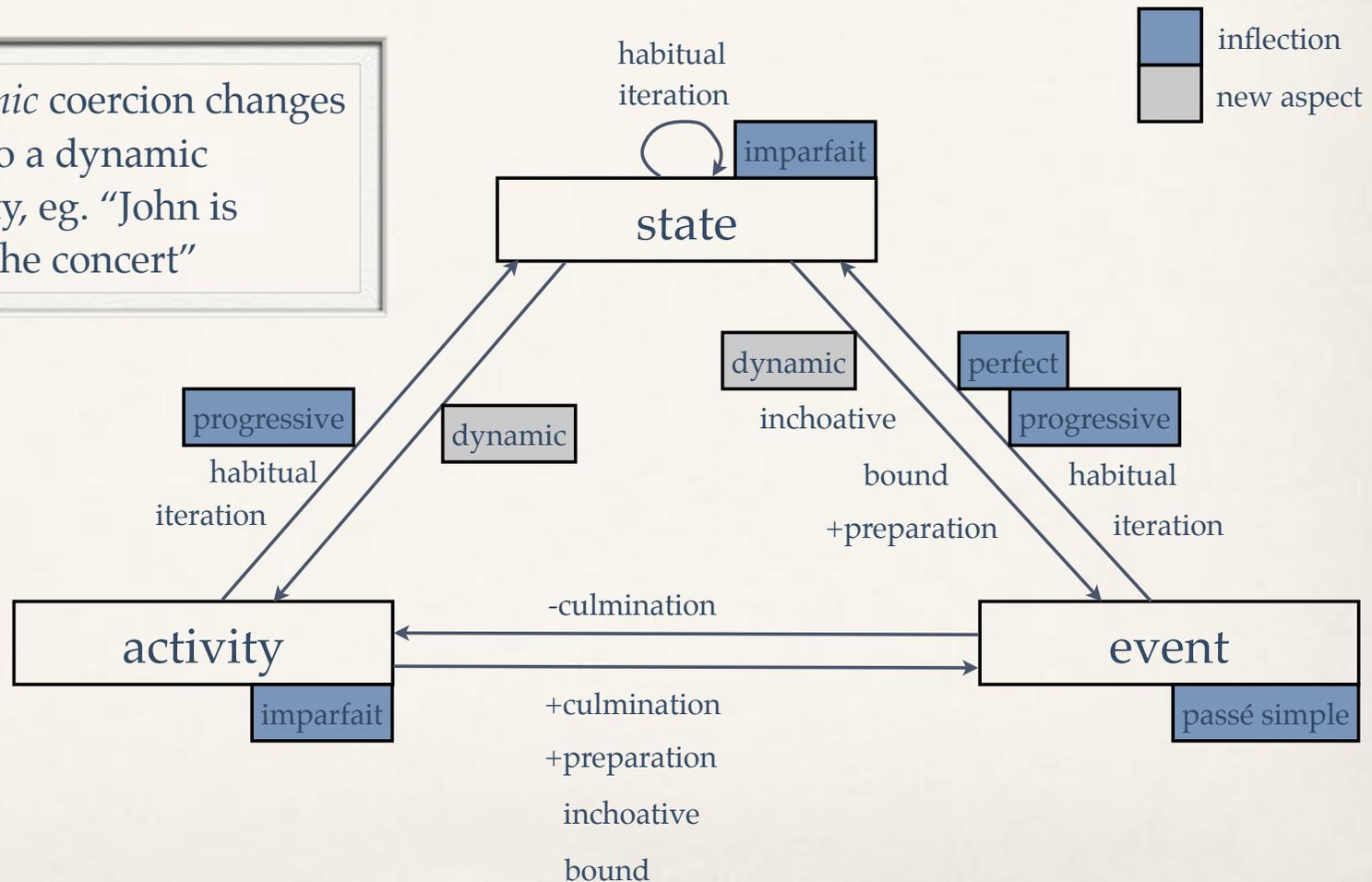
de Swart (1998)

The *inchoative* coercion permits the conversion of a homogenous eventuality into an event. eg. "Suddenly, John knew the answer"



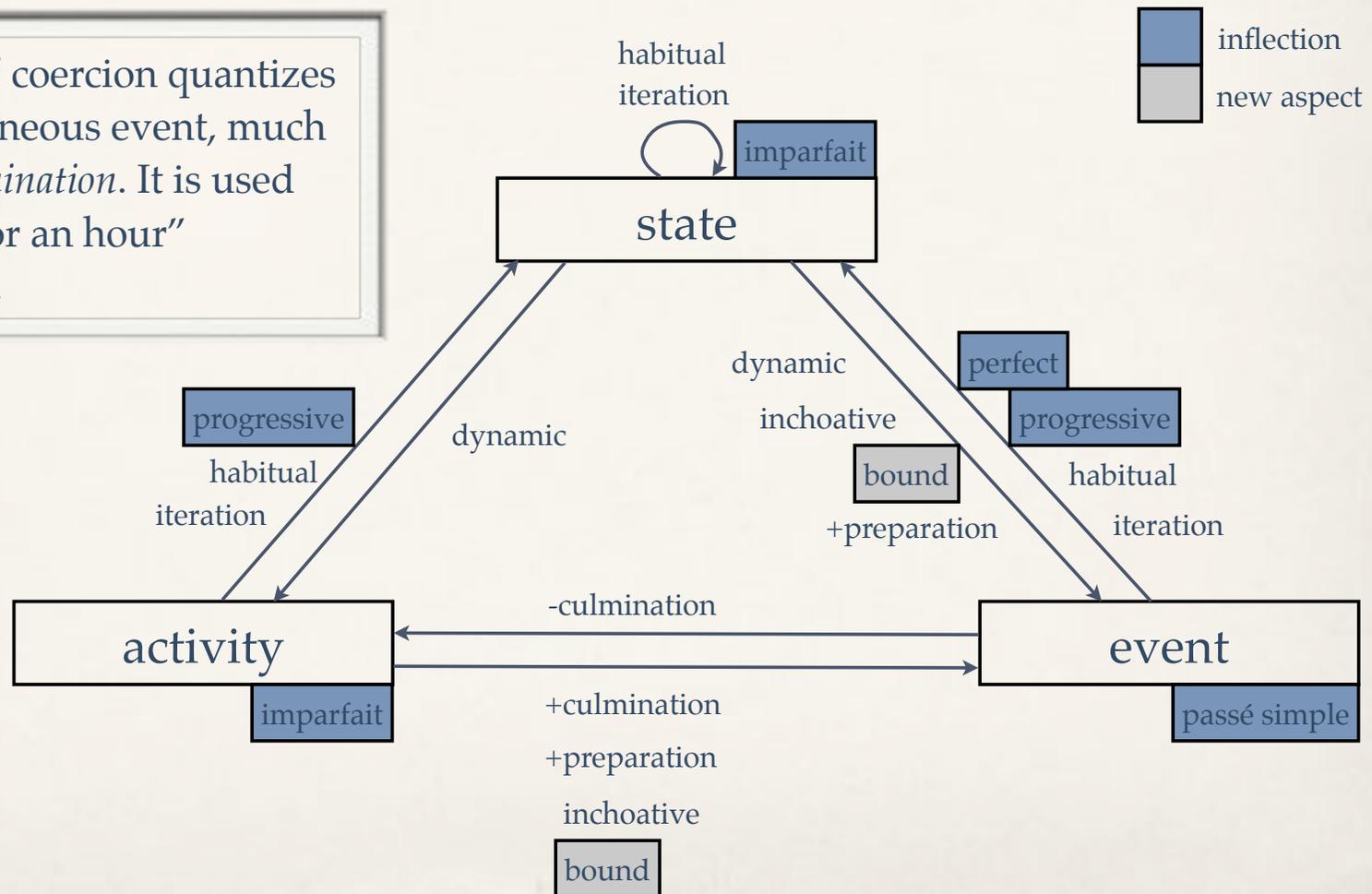
de Swart (1998)

The *dynamic* coercion changes a state into a dynamic eventuality, eg. "John is enjoying the concert"



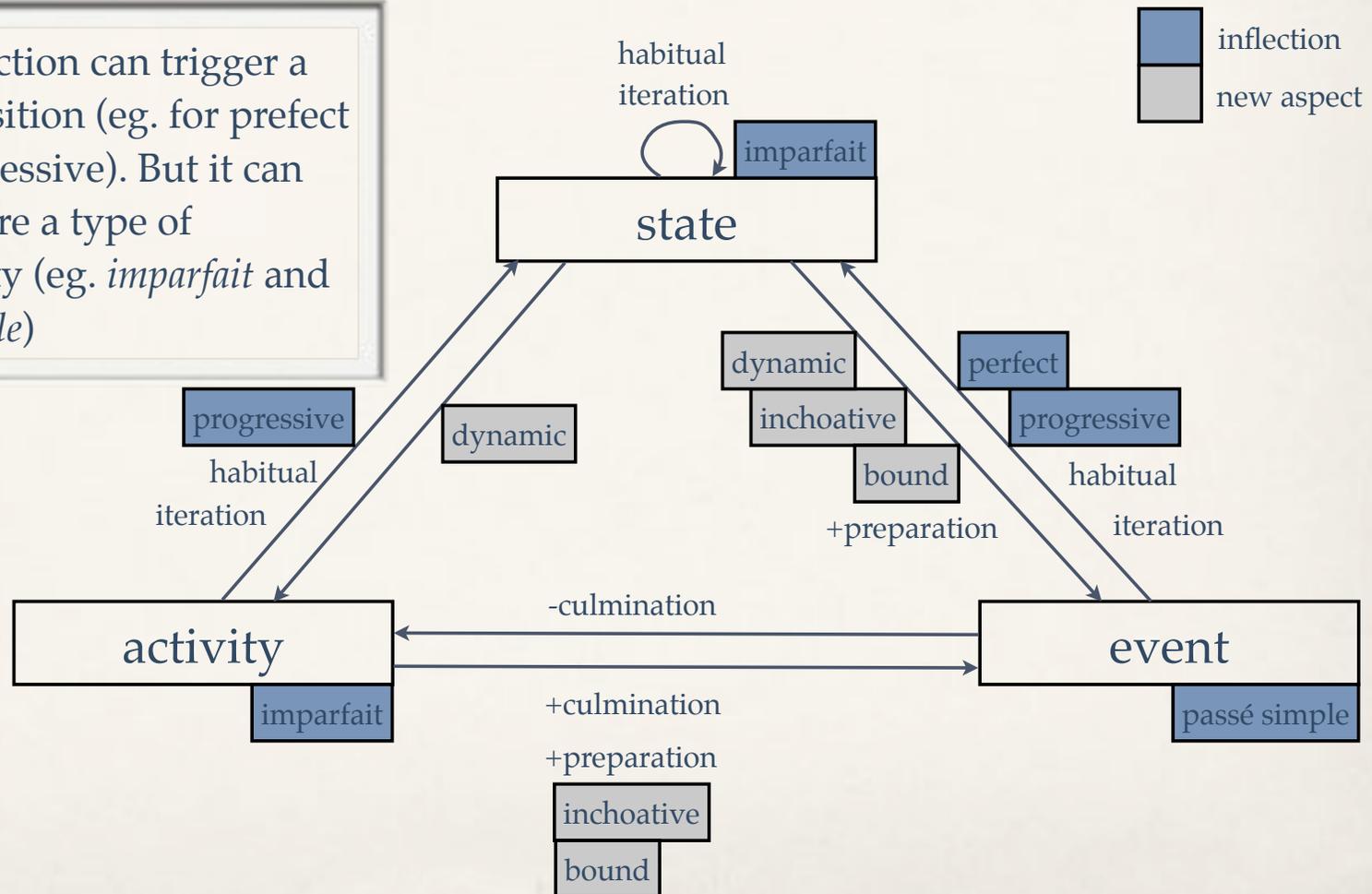
de Swart (1998)

The *bound* coercion quantizes a homogeneous event, much like *+culmination*. It is used for the “for an hour” modifiers.



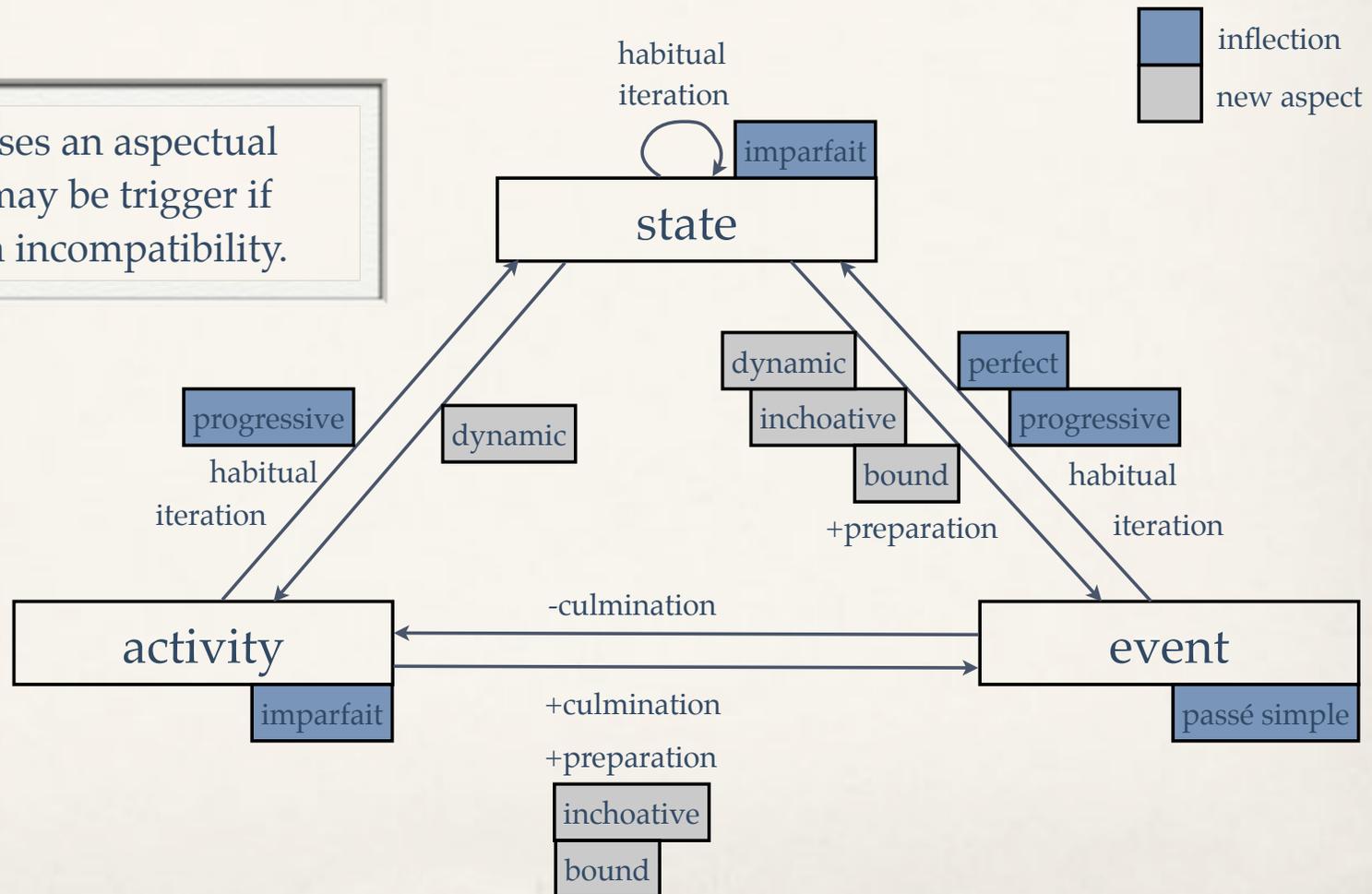
de Swart (1998)

Verb inflection can trigger a state transition (eg. for perfect and progressive). But it can also require a type of eventuality (eg. *imparfait* and *passé simple*)



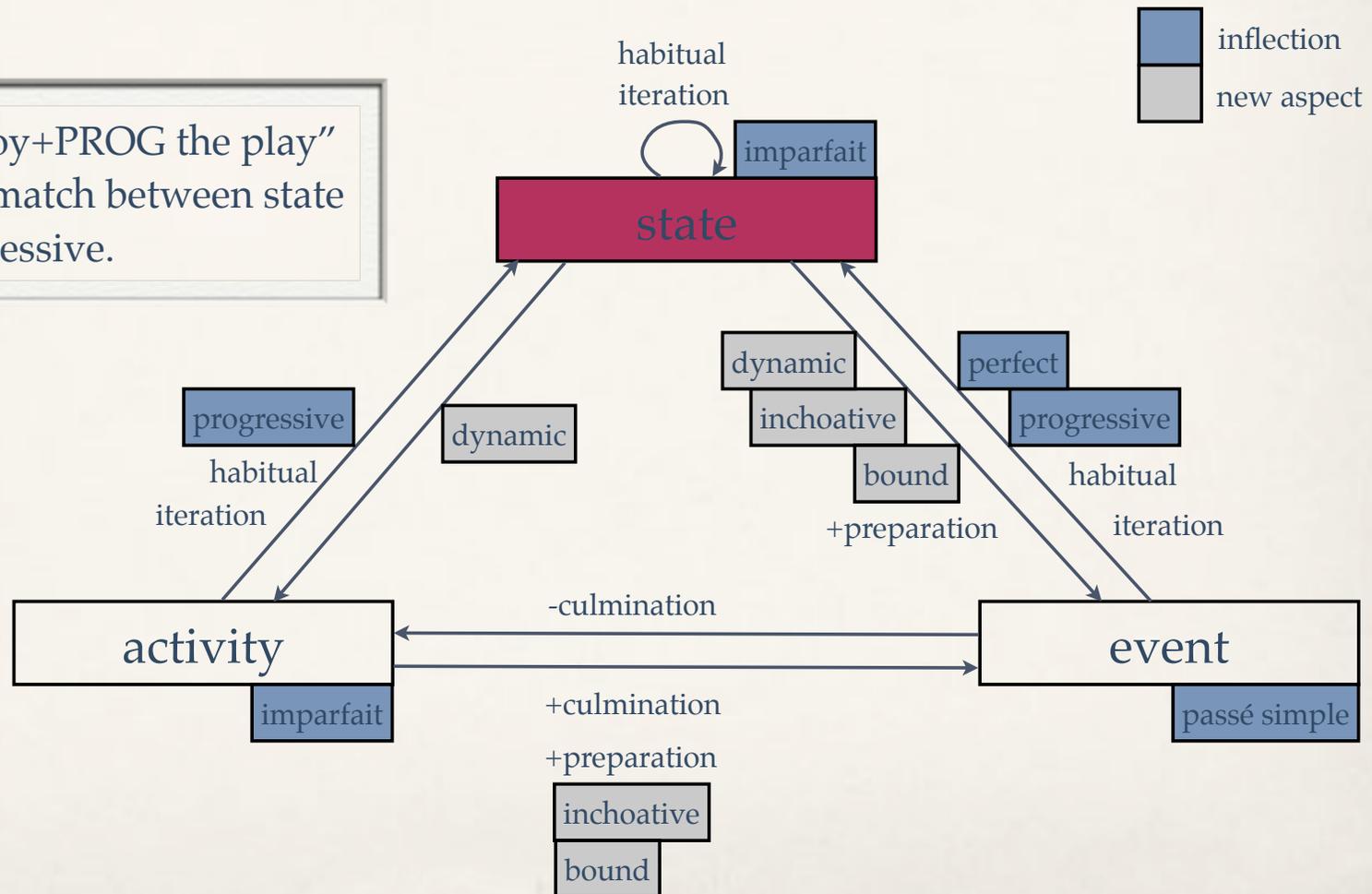
de Swart (1998)

In both cases an aspectual coercion may be triggered if there is an incompatibility.



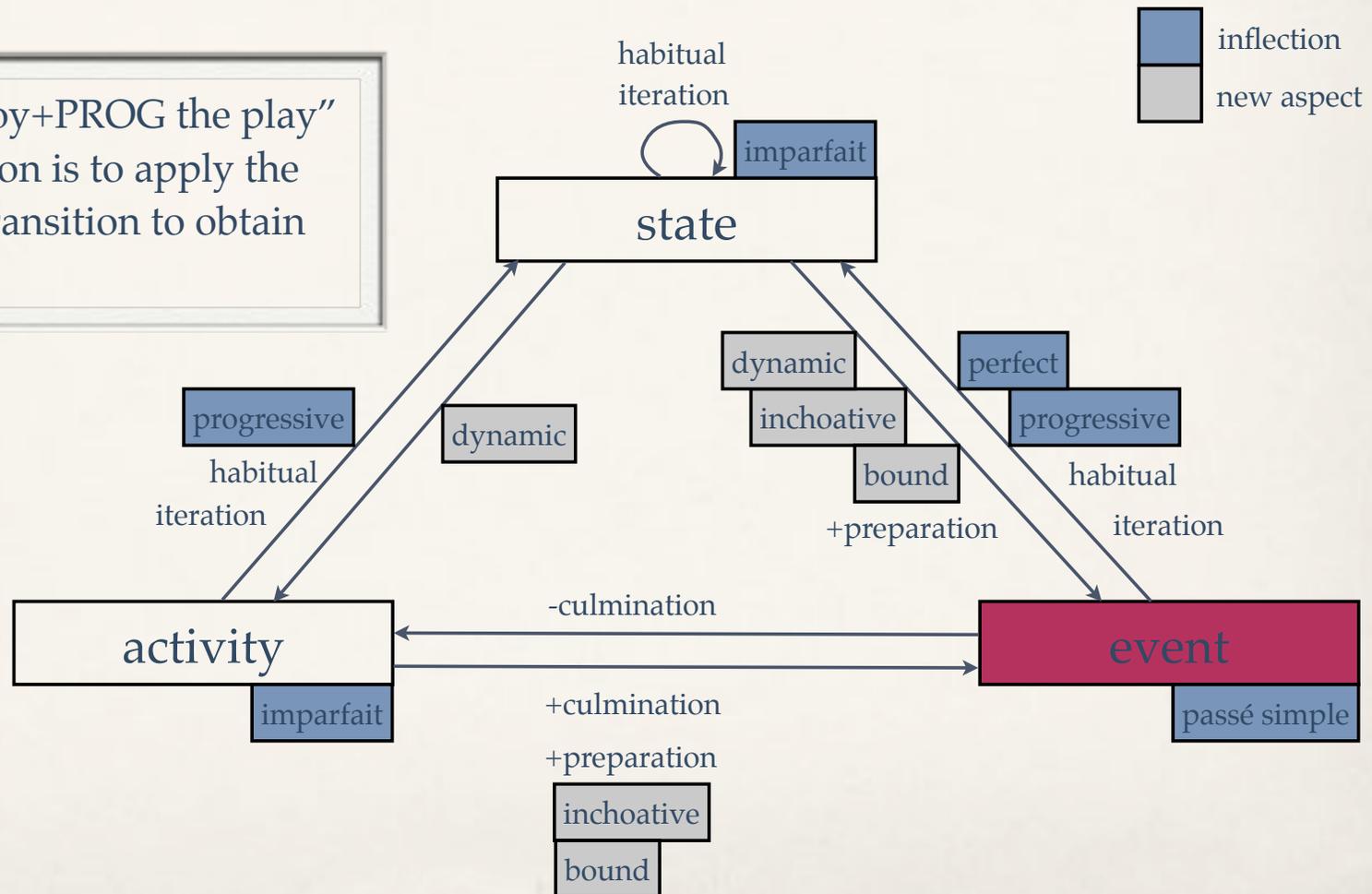
de Swart (1998)

“John enjoy+PROG the play”
has a mismatch between state
and progressive.



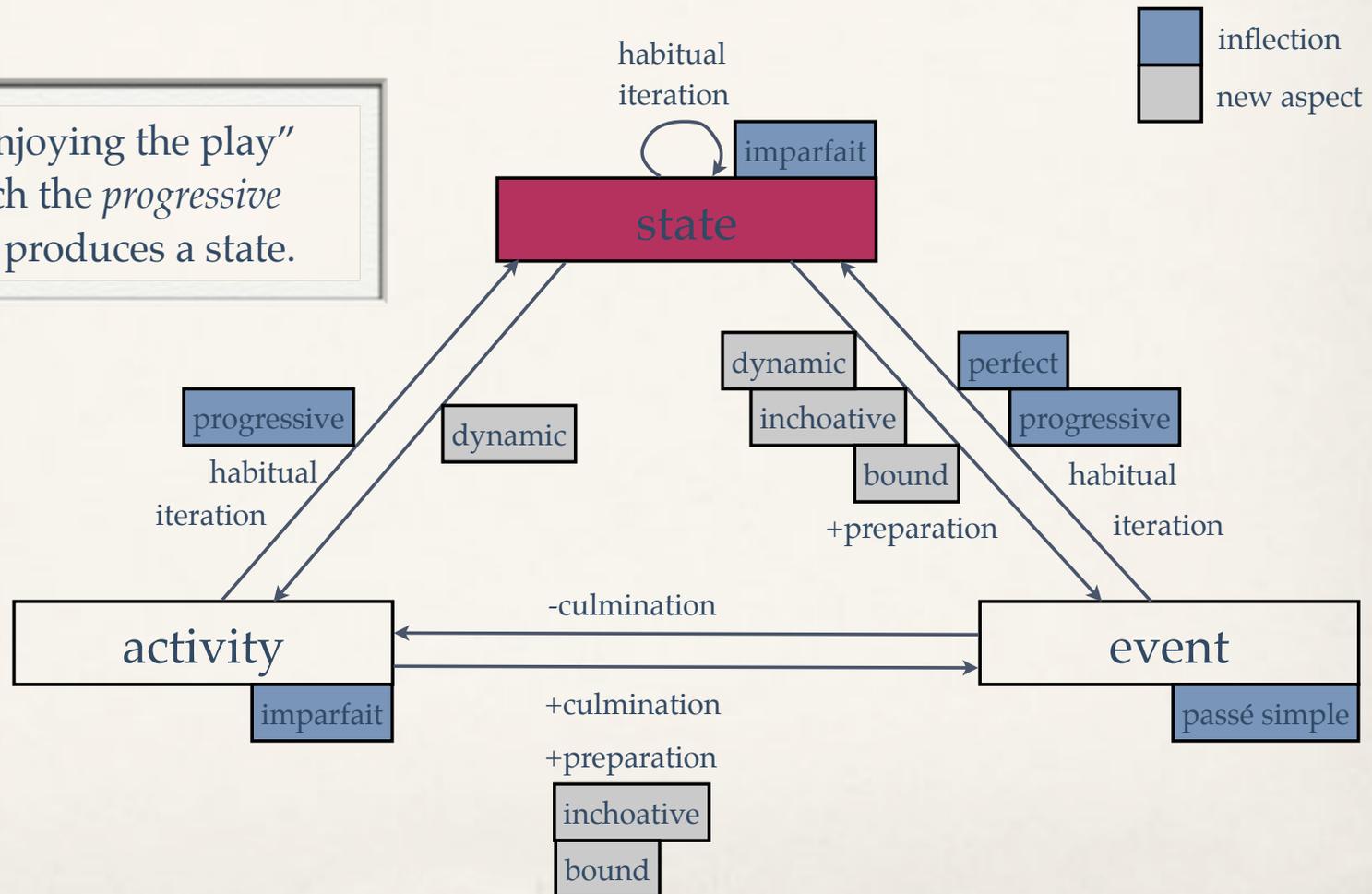
de Swart (1998)

“John enjoy+PROG the play”
 one solution is to apply the
dynamic transition to obtain
 an event



de Swart (1998)

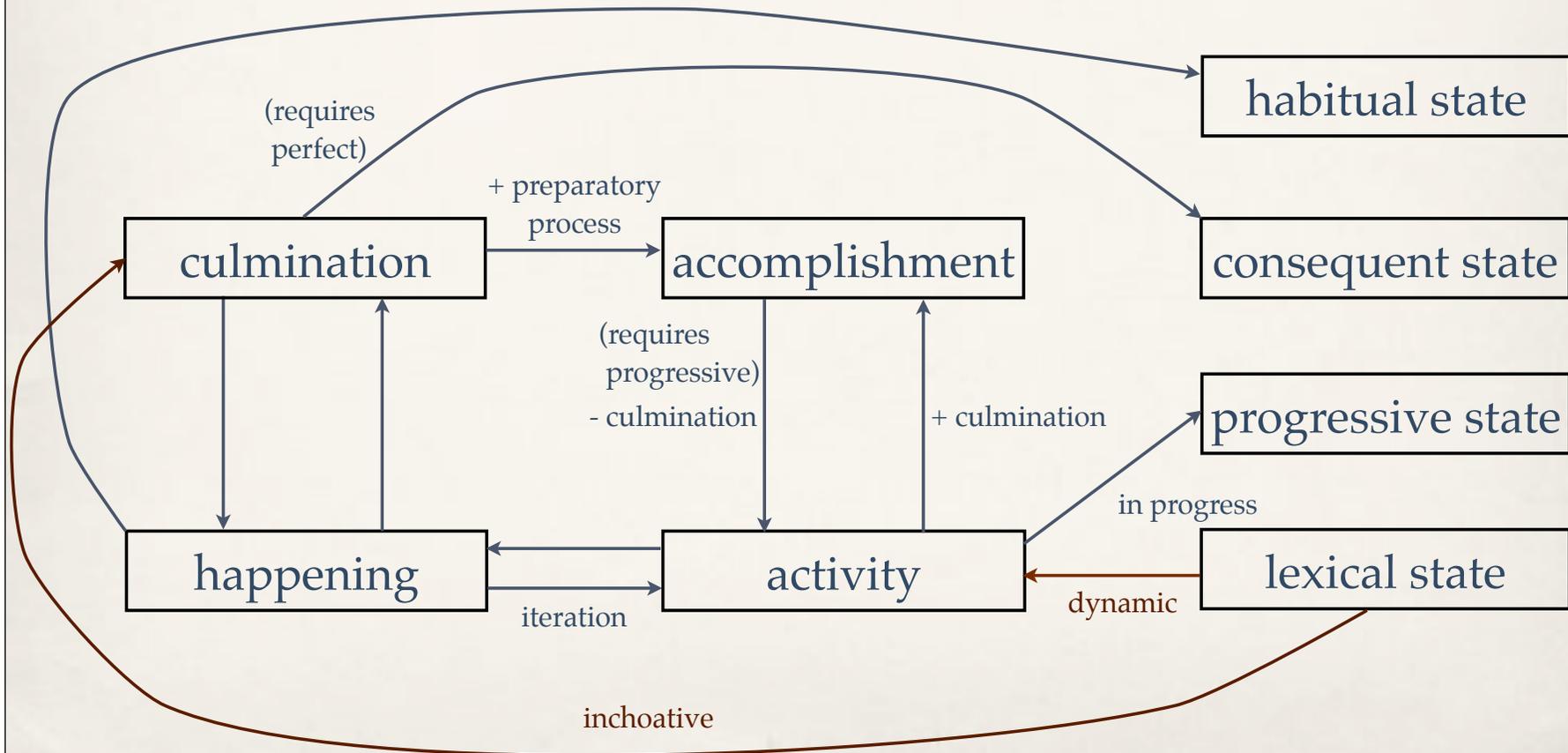
“John is enjoying the play”
from which the *progressive*
transition produces a state.



Moens & Steedman incorporating de Swart

The new "dynamic" arrow would apply in cases like "John is being a jerk" and "John is enjoying the concert"

The "inchoative" arrow would correspond to "Suddenly, John knew the answer". This seems to correspond the most to de Swart who implements it as a coercion to an event; however, I find it hard to do any further coercions other than to "consequent state" and this without a perfect.



Conclusions

- * Vendler's article has been a very influential article about aspect.
- * Aspect is a very large research subject and I have only touched upon some of the very basic data. Be careful that there is a lot of difference in terminology for the verb classes and a lot of same terminology used differently.
- * However, even for these basic data, there is often room for discussion as the distinctions are not always that clear, especially when the possibility of coercions often depends crucially on both the context and our world knowledge.

References

- * Dowty, D. (1979), *Word Meaning and Montague Grammar*, Kluwer
- * Kamp & Reyle (1993), *From Discourse to Logic*, Springer.
- * Moens & Steedman (1988), *Temporal Ontology and Temporal Reference*, *Computational Linguistics* **14**(2), 15-28.
- * de Swart (1998), *Aspect Shift and Coercion*, *Natural Language and Linguistic Theory* **16**, 347-385.
- * Vendler, Z. (1957), *Verbs and Times*, *The Philosophical Review* **66**(2), 143-160, *reprinted as Chapter 4 of Vendler, Z., Linguistics in Philosophy* (1967)

Some notes to myself on the
coercions permitted by de
Swart
e: event
a: activity
s: state

passé simple: a,s -> e
(to accomplishment)

imparfait: e -> a,s
(to activity /

progressive / habitual
state?)

PERF: e->s

culmination -> consequent state

PROG: a,e -> s (remove culmination)

activity -> progressive state (free)

PROC: e-> a

accomplishment -> activity (?)

ITER: a,e,s -> s

(happening -> state)

HAB: a,e,s -> s

(happening -> habitual state)

ADD-CUL: a -> e

(activity -> accomplishment)

ADD-PREP: a,s -> e

(culmination -> accomplishment)

INCHO: a,s -> e

(lexical state -> culmination ?)

BOUND: a,s -> e

(activity to accomplishment)

DYNAMIC: s -> a,e

(lexical state -> activity)

FOR/PENDANT +sqa: a,s -> e

IN/EN: e-> e