

PLURACTIONAL ADVERBIALS AS INCREMENTAL QUANTIFIERS

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INTRODUCTION

Quantifier-**internal** readings of *new/different/etc.*:

- (1) Every day there is a different problem.

Licensed only by a small class of quantifiers, incl. *every/each, whenever, day after day* (Brasoveanu, 2011). This class is unified, per Bumford (2015), by being dynamic and incremental.

Hungarian *-nként* forms **periodic frequency adverbials**, and in that usage, licenses internal readings (as do *daily, every day*):

- (2) nap-onként új jelentés-t kell írni
day-DIV new story-ACC must write.INF
‘We have to write a new story daily.’

Complication 1: Unlike ordinary universals, periodic frequency adverbials are **atelic**:

- Mary visited every European capital in/*for six months.
- Mary swam every day for/*in six months (Almeida, 1992).

Complication 2: Hungarian *-nként* has a range of uses. Halm & Bende-Farkas (2024) distinguish **bottom-up** uses (the VP repeats) from **top-down** uses (one macro-event is subdivided into subevents keyed to distinct instances of the stem):

- Iterative** (bottom-up; *hétenként* ‘weekly’)
- Manner** (top-down; Grandma took the pill *negyed-enként* ‘in quarters’): like English *X-by-X*.
 - No indefinite variation: *I fed someone the pill quarter by quarter* involves same person throughout.
 - Exhaustivity: The quarters exhaust the pill / The entire pill was taken.
 - Telic!
- Basis** (arrange the clothes *színenként* ‘by color’, talent differs *gyerekenként* ‘by child’): like English *by X/according to X*.

Goal: Explain scope wrt indefinites and internal readings, aspectual profiles, and exhaustivity (or not), positing only one lexical entry for *-nként*.

Strategy: Bumford’s **incremental quantification** + Pratt & Francez’s **cascades** (via Beaver and Condoravdi’s **linking semantics**); **extend** cascades to **core arguments**.

FRAMEWORK I — DYNAMICS

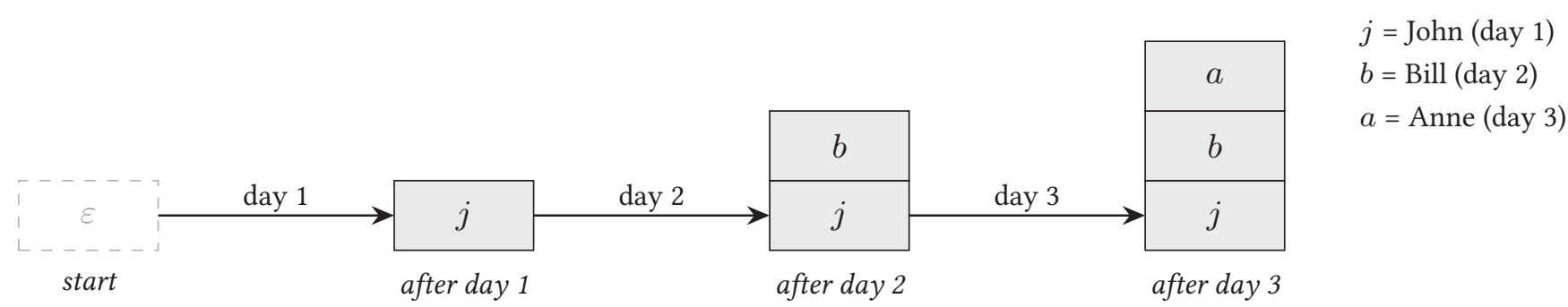
Following Bumford (2015): a context (“state”) is a **stack** of entities introduced so far. Sentence meanings are sets of pairs $\langle m, s \rangle$, where m is an ordinary static meaning and s is a state.

Dynamic conjunction: $(p \wedge q) = \lambda s. \{ \langle a \wedge b, s'' \rangle \mid \langle a, s' \rangle \in p s, \langle b, s'' \rangle \in q s' \}$

Every is iterated dynamic conjunction, one update per restrictor-individual:

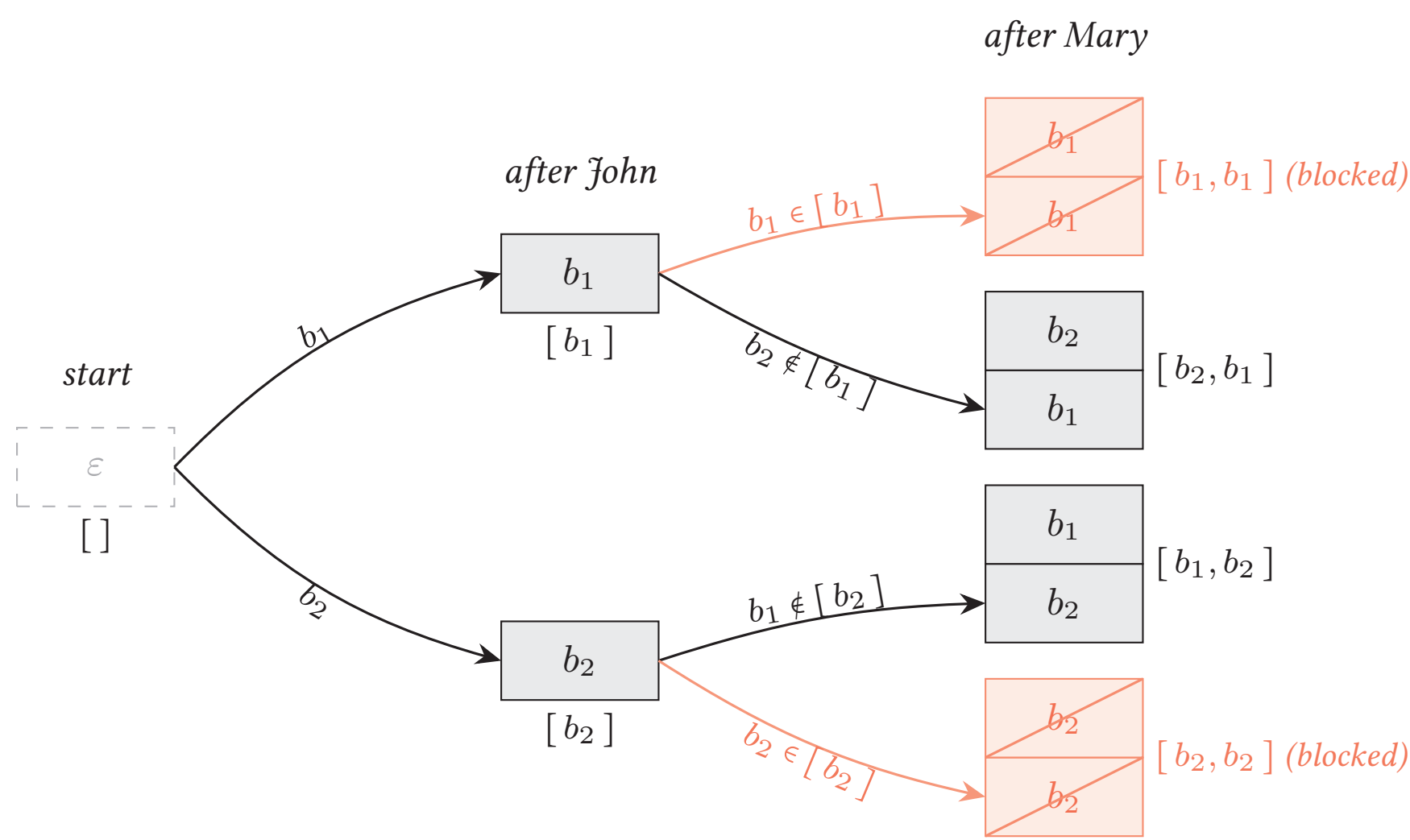
$$\mathbf{every}(\mathbf{Restr})(Q) := \bigwedge [Q(x) \mid x \leftarrow \mathbf{Restr}]$$

Someone sneezed every day:



Internal readings of *different* require $x \notin s$.

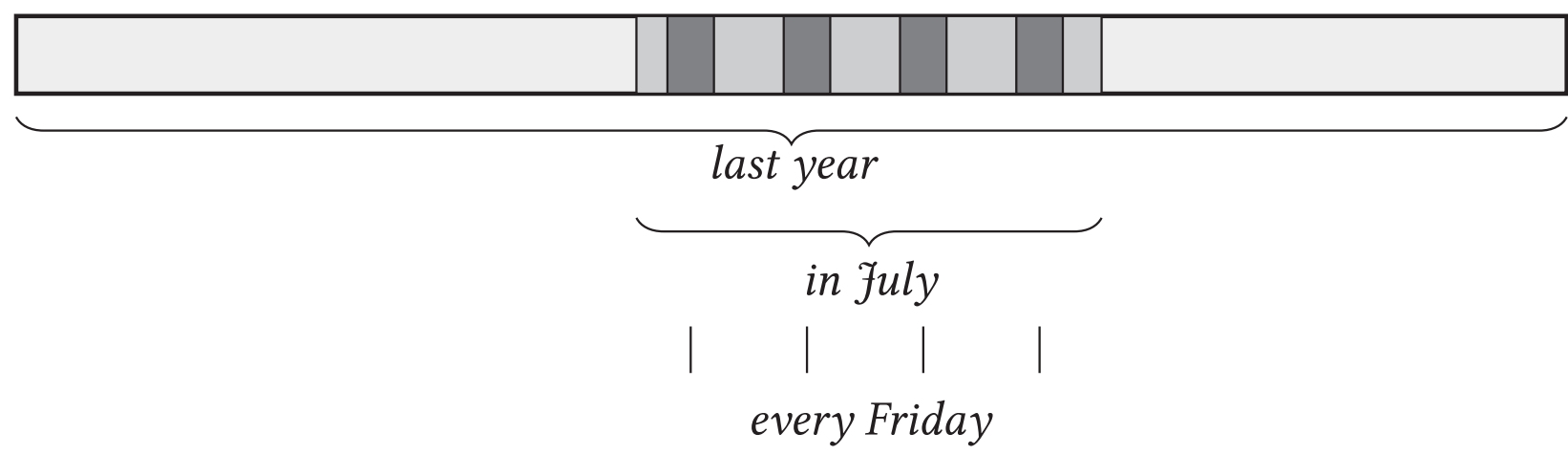
Update sequence for *Every student read a different book*



CASCADING DOMAIN RESTRICTION

Temporal adjuncts cascade (Pratt & Francez, 2001):

- (3) Last year, in July, every Friday, Mary swam.



The time role gets progressively narrowed as adjuncts stack.

FRAMEWORK II — LINKING SEMANTICS

Following Beaver & Condoravdi’s (2007) **linking semantics**, verb meanings are dynamic predicates over **linking structures** ρ : finite maps from role labels to values.

Here we posit real events verifying linking structures, too:

- $(\rho : \text{ROLE} \mapsto v)$: ρ , but with **ROLE** now pointing to v .
- $e \sim \rho$: event e **verifies** ρ — e ’s runtime falls within ρ .**TIME** (cf. B&C’s temporal closure axiom).
- $|e|$: e ’s own **exact** matrix (unique).

To implement cascading: each temporal adjunct reads the current ρ .**TIME** before narrowing it.

UNIFIED SCHEMA FOR -NKÉNT

$$\prod [u_1, \dots, u_n] := u_1 \odot \dots \odot u_n,$$

where $\odot$ depends on the type of the u_i :

- type t : $\odot$ is $\wedge$;
- type v/e : $\odot$ is $\oplus$ (mereological sum);
- type $s \rightarrow \{\alpha \times s\}$:
 $p \odot q := \lambda s. \{ \langle a \odot b, s'' \rangle \mid \langle a, s' \rangle \in p s, \langle b, s'' \rangle \in q s' \}$

For a segmenter μ — the actual parameter *-nként*’s nominal complement supplies (*nap* ‘day’ $\mapsto \mu$ =**days**, *negyed* ‘quarter’ $\mapsto \mu$ =**quarters**, *szín* ‘color’ $\mapsto \mu$ =**colors**) — and a role R :

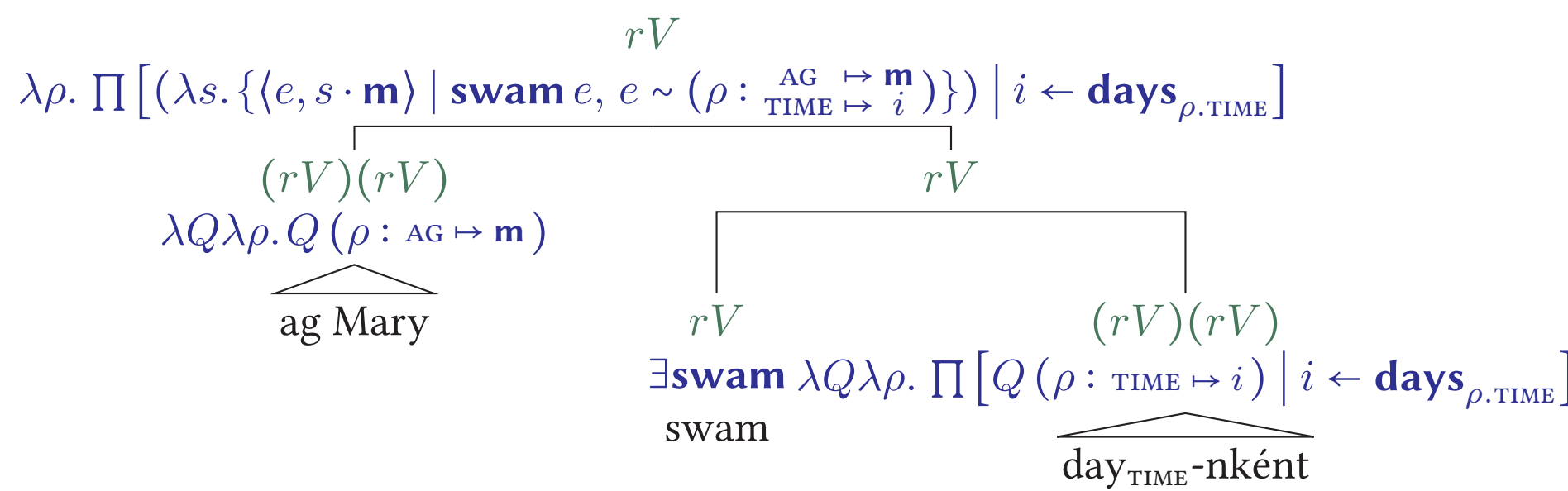
$$\mu_R\text{-nként} := \lambda Q \lambda \rho. \prod [Q(\rho : R \mapsto x) \mid x \leftarrow \mu_{\rho.R}]$$

Common to all three uses (iterative/manner/basis). What differs is only what gets fed to it as Q , and by what route (“mode”).

MODE 1 — FRAME ADVERBIAL

Dynamic existential closure of a predicate P :

$$\exists P := \lambda \rho \lambda s. \{ \langle e, s \rangle \mid P e, e \sim \rho \} \quad (\text{type } rV)$$



$\Rightarrow$ Atelicity $\checkmark$. Any gap-free stretch of the time frame picks out a contiguous run of cells in the day-segmentation, and success of the Π -fold is preserved under contiguous sub-lists.
 $\Rightarrow$ Internal readings of *uj* ‘new’ via Bumford’s mechanism $\checkmark$.

MODE 2 — MANNER ADVERBIAL

- (4) A nagymama negyed-enként vette be a tablettát
the grandma quarter-NKENT took.DEF PREV the pill.ACC
‘Grandma took the pill in quarters.’

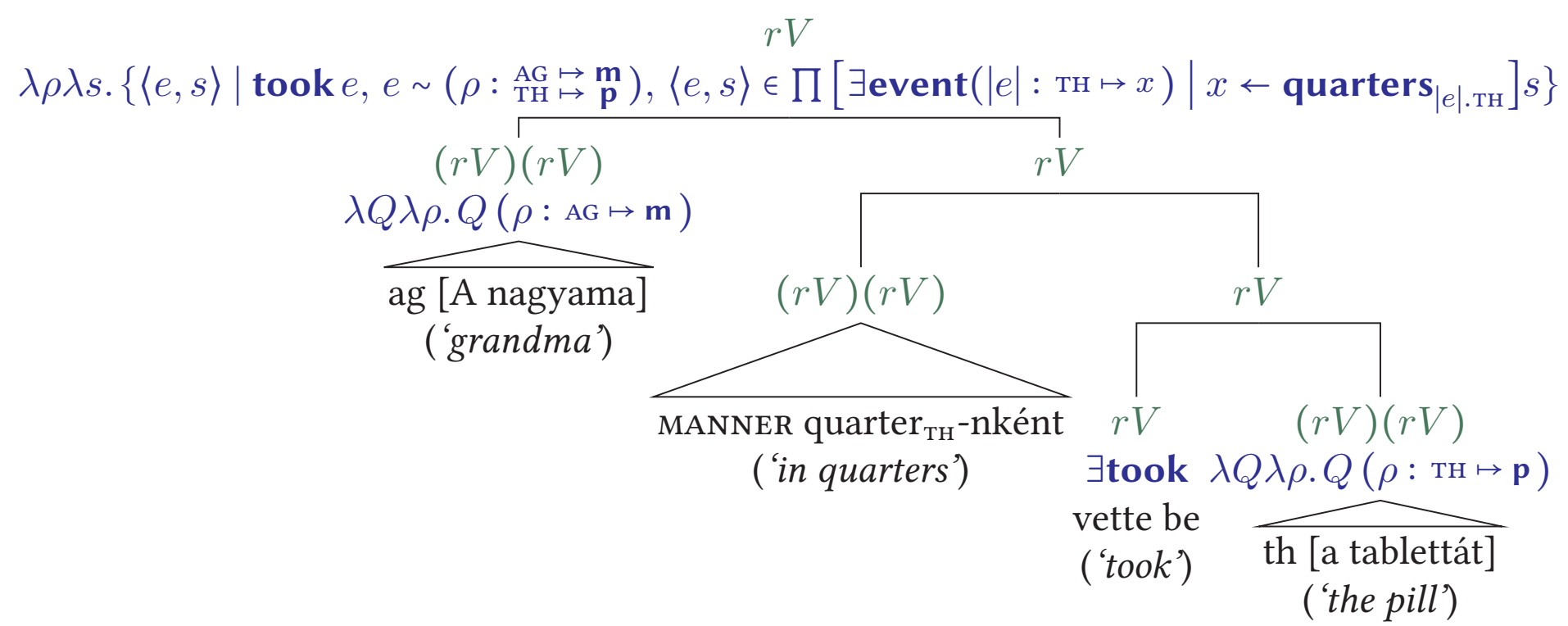
Here *-nként* composes via a silent **MANNER** head:

$$\lambda \mathcal{T} \lambda Q \lambda \rho \lambda s. \{ \langle e, s'' \rangle \mid \langle e, s' \rangle \in Q \rho s, \langle e, s'' \rangle \in \mathcal{T} (\exists \mathbf{event}) |e| s' \}$$

- $\mathcal{T}$: $((rV)(rV))$ will be instantiated by *X-nként*
- Q : rV comes from the VP
- Roughly, e satisfies both Q and $\mathcal{T}$. More precisely:
 - e satisfies Q wrt ambient ρ
 - e satisfies $\mathcal{T}$ wrt e ’s exact matrix $\leftarrow$ cascading!
- Dynamics: Output state of Q fed into $\mathcal{T}$ (not in play for (4))

MODE 2 — MANNER ADVERBIAL (CONT’D)

A nagymama negyed-enként vette be a tablettát

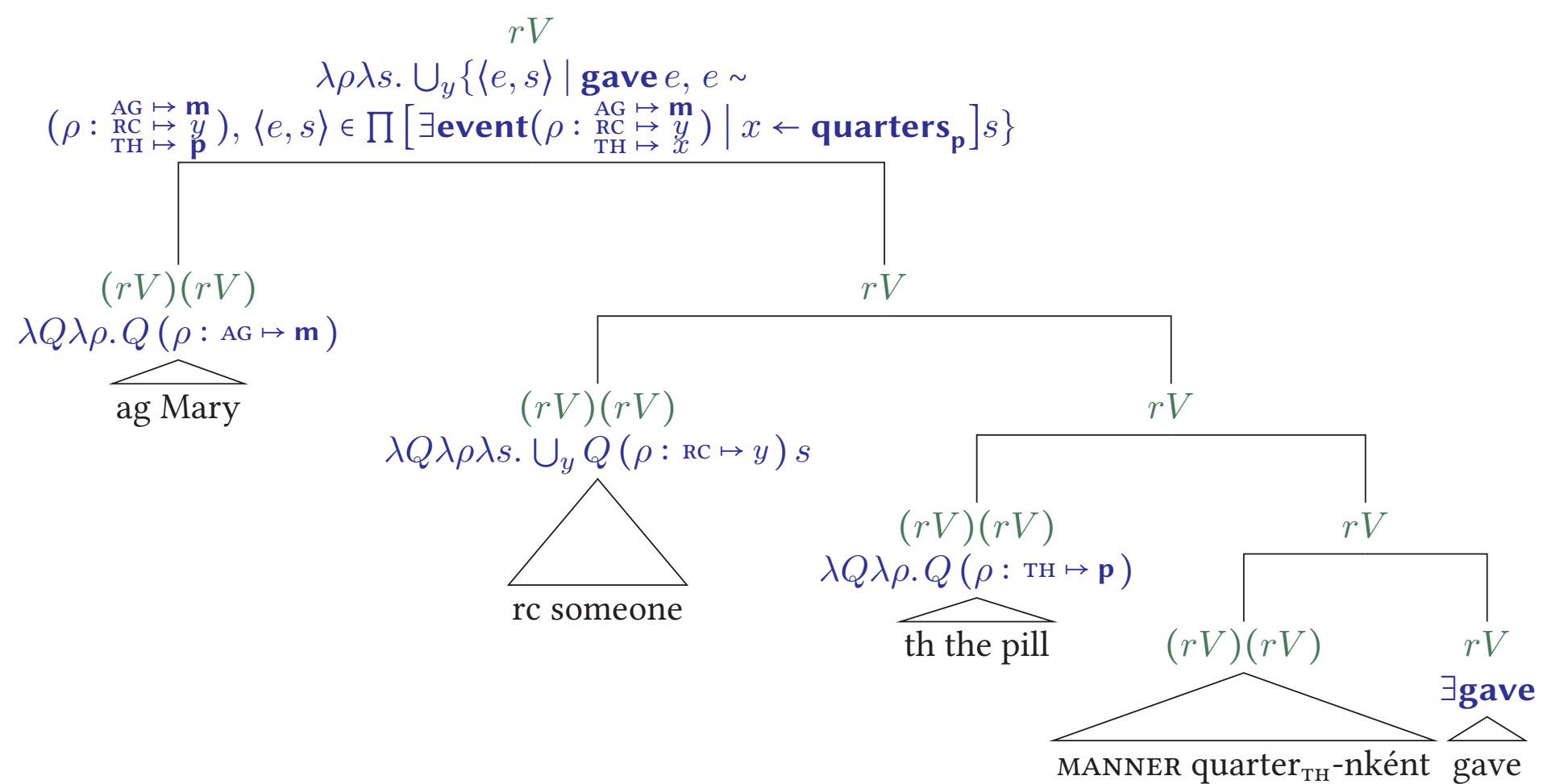


$\Rightarrow$ Exhaustivity: the sentence entails *Grandma took the pill* $\checkmark$

$\Rightarrow$ Telicity

$\Rightarrow$ No covariation with an indefinite:

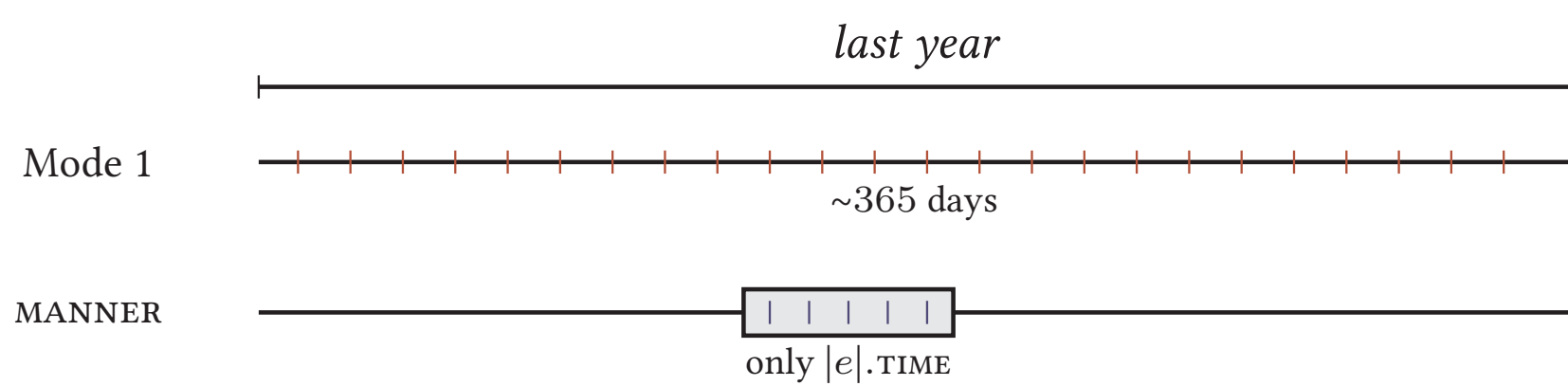
- (5) Mary gave someone the pill in quarters.



Since $|e|$ copies e ’s own **AG/RC** into every part, *someone* cannot covary across quarters. $\checkmark$

Frame/manner ambiguity: a temporal segmenter like **days** can enter *either* way:

- (6) Last year, Mary read a book day-nként: (i) daily, she read a book; or (ii) day by day, she read one book.



MODE 3 — BASIS

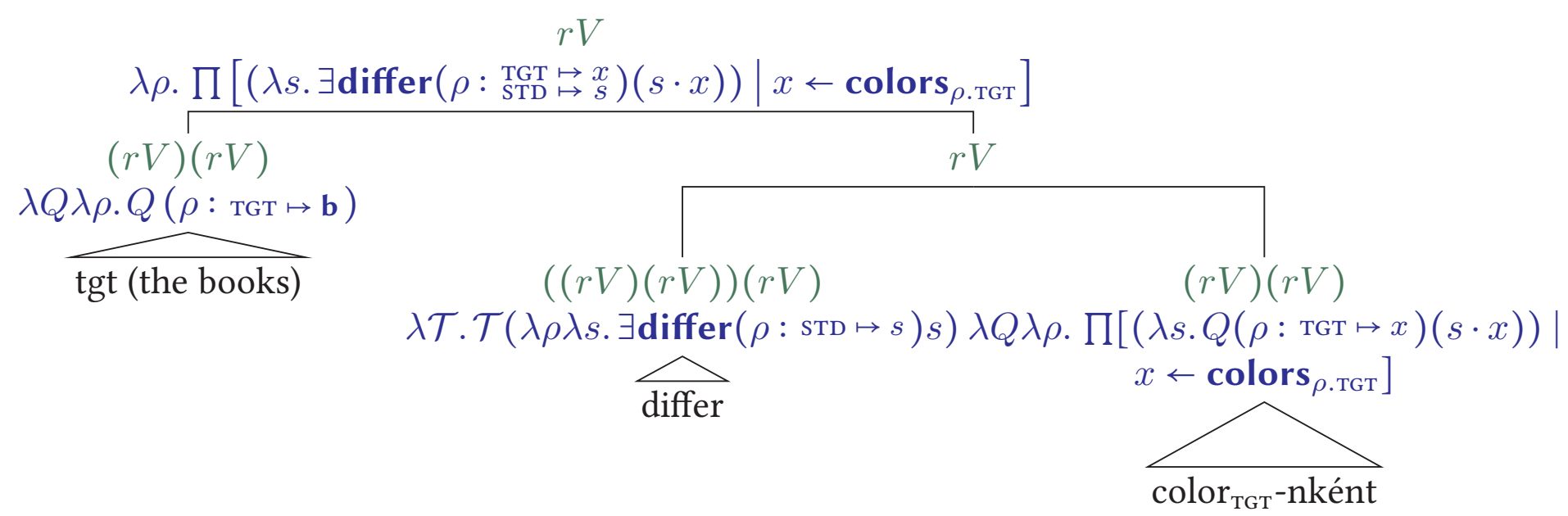
No manner head here: the **verb itself** takes the *-nként* phrase as its argument.

arrange: $\lambda \mathcal{T}. \mathcal{T} (\exists \mathbf{place}\text{-}\mathbf{tog})$

Mary arranged the books by color

$$\lambda \rho \lambda s. \prod [\exists \mathbf{place}\text{-}\mathbf{tog} (\rho : \text{AG} \mapsto \mathbf{m}, \text{TH} \mapsto x) \mid x \leftarrow \mathbf{cols}_{\rho, \text{TH}}] (s \cdot \mathbf{b} \cdot \mathbf{m})$$

The books differ in color



A **differ**-event relates a target (**TGT**) to a standard of comparison (**STD**), identified with the current stack: each color-block is checked against every block encountered before it.

To do:

- (7) A matematikai tehetség gyerek-enként különbözik
the mathematical talent child-NKENT differ.3SG
‘Mathematical talent differs from child to child.’

SUMMARY

- One segmenter-plus-fold object, reused throughout; varies wrt *what it composes with*, and *by what route*.
- The manner construction’s entailment to the plain VP, and its immunity to indefinite covariation, both fall out of one definition.
- Differ* is an anaphoric verb, lexicaling the successive-state trick behind internal readings with *every*.

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