



Operator, information

Revisiting the operator projection in RRG, with special emphasis on tense, aspect, and finiteness

Jürgen Bohnemeyer

RRG 2019 August 21, 2019

Operator, information

In case you wondered about the title...



SYNOPSIS

- ▶ Operators: an evolutionary approach
- ▶ Operator projections: implications
- ▶ Unified theories of TAM
- ▶ The proper treatment of TAM in RRG
- ▶ Summary

OPERATORS: AN EVOLUTIONARY APPROACH

► Operators in RRG

“Grammatical categories like aspect, tense and modality are treated as operators modifying different layers of the clause. (...) No language need have all of these operators as grammatical categories; for example, English, unlike Kewa and Quechua, does not have evidentials as a grammatical category. The only operators which every language has are illocutionary force and negation..” (Van Valin 2005: 8-9)

Nuclear operators:

Aspect

Negation

Directionals (only those modifying orientation of action or event without reference to participants)

Core operators:

Directionals (only those expressing the orientation or motion of one participant with reference to another participant or to the speaker)

Event quantification

Modality (root modals, e.g. ability, permission, obligation)

Internal (narrow scope) negation

Clausal operators:

Status (epistemic modals, external negation)

Tense

Evidentials

Illocutionary force

Table 1.1. *Operators in the layered structure of the clause (Van Valin 2005: 9)*

▶ operator projections in RRG

“Johnson (1987) proposed a formalization of the layered structure of the clause in which predicates and their arguments are represented in a distinct projection from the one representing operators. This formalization he termed a ‘projection grammar’.” (Van Valin 2005: 12)

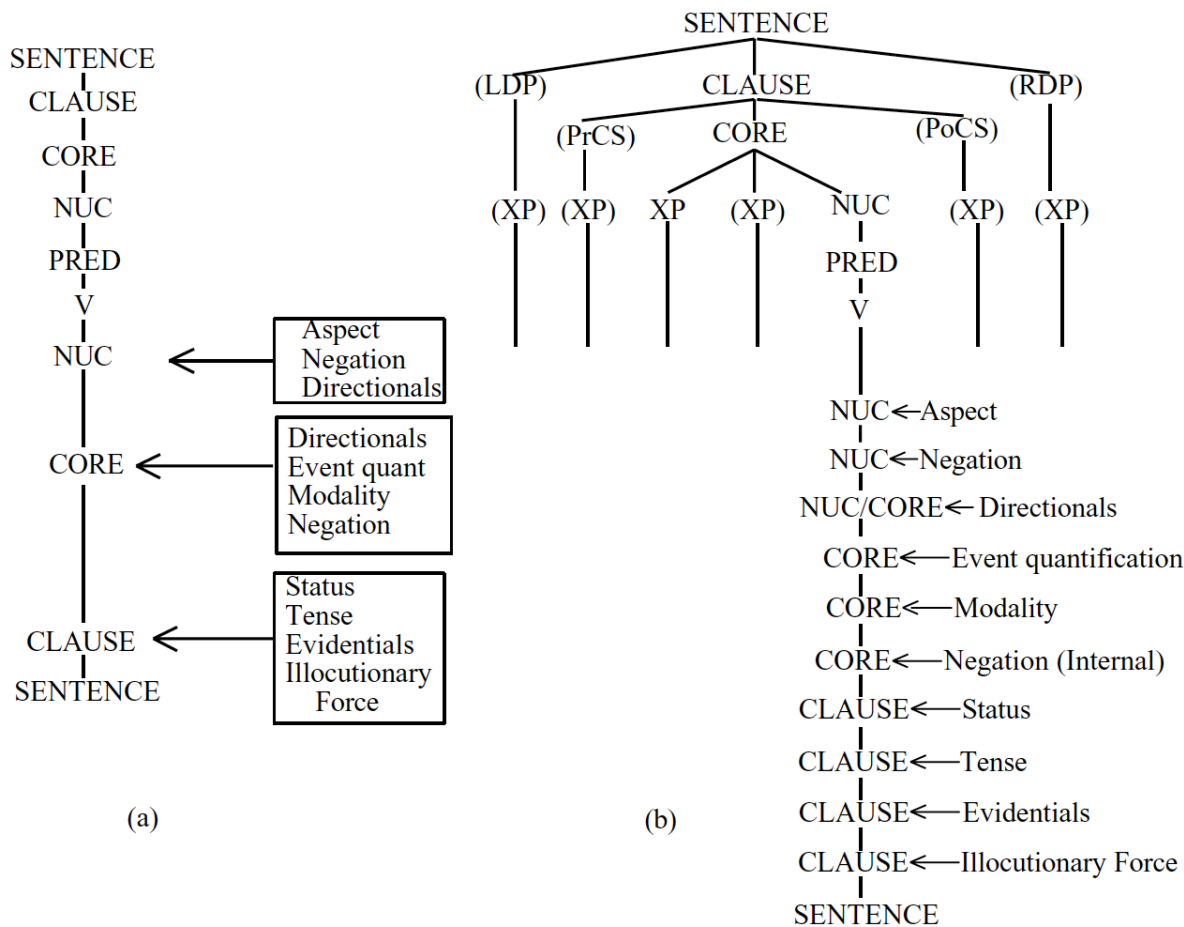


Figure 1.1. Layered structure of the clause with constituent and operator projections (Van Valin 2005: 12)

- ▶ my goals today
 - ▶ try and sketch a model that predicts from first principles
 - ▶ what operators *are* (and what they are not)
 - ▶ in other words, what expressions are entitled to operator projection placement
 - ▶ what layers operators operate on
 - ▶ against this backdrop, propose revisions that
 - ▶ incorporate into RRG the consensus model on tense-aspect semantics that emerged in the 1990s
 - ▶ introduce to the theory the flexibility needed to deal with the relevant phenomena in tenseless languages

- ▶ previous classifications: Hockett 1956

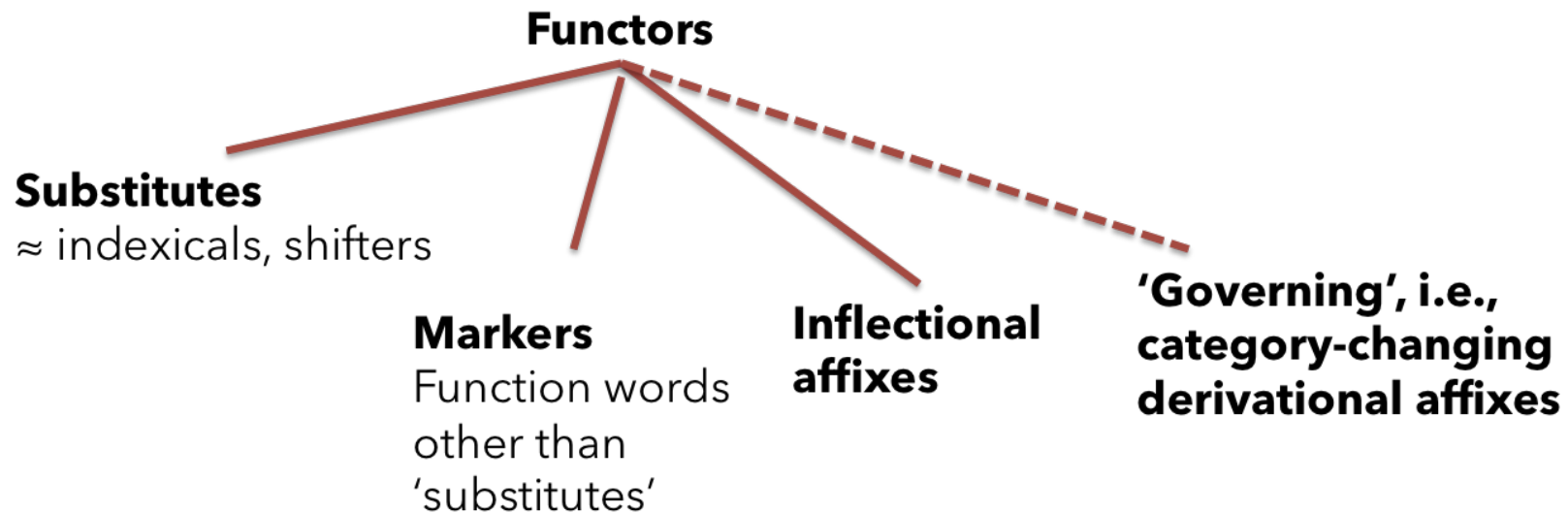
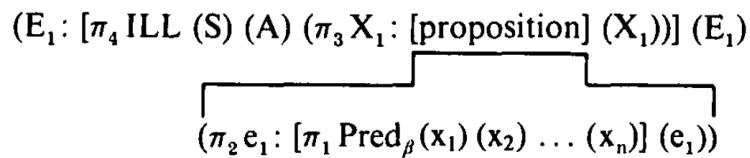


Figure 1.2. *Hockett's (1956: 264-265) taxonomy of operators (or 'functors')*

▶ previous classifications: Hengeveld 1989

Table 1.2. Hengeveld's (1989: 131-132) classification of operators in Functional Grammar

Operators (positions)



π_1 : predicate operators π_3 : proposition operators

π_2 : predication operators π_4 : illocution operators

- (i) PREDICATE OPERATORS capture the grammatical means which specify additional properties of the set of SoAs designated by a bare predication.
- (ii) PREDICATION OPERATORS capture the grammatical means which locate the SoAs designated by a predication in a real or imaginary world and thus restrict the set of potential referents of the predication to the external situation(s) the speaker has in mind.
- (iii) PROPOSITION OPERATORS capture the grammatical means through which the speaker specifies his attitude towards the (truth of the) proposition he puts forward for consideration.
- (iv) ILLOCUTION OPERATORS capture the grammatical means through which the speaker modifies the force of the basic illocution of a linguistic expression so as to make it fit his communicative strategy.

Semantic domain	Grammatical category
Predicate operators	
Internal temporal constituency	Imperfective/Perfective, Phasal Aspect
Presence or absence of property or relation expressed by predicate	Predicate negation
Predication operators	
Time of occurrence	Tense
Frequency of occurrence	Quantificational Aspect
Actuality of occurrence	Objective mood/Polarity
Proposition operators	
Source of proposition	Evidential mood
Commitment to proposition	Subjective mood
Illocution operators	
Weakening strategy	Mitigating mode
Strengthening strategy	Reinforcing mode

▶ previous classifications: mainstream Generative Grammar

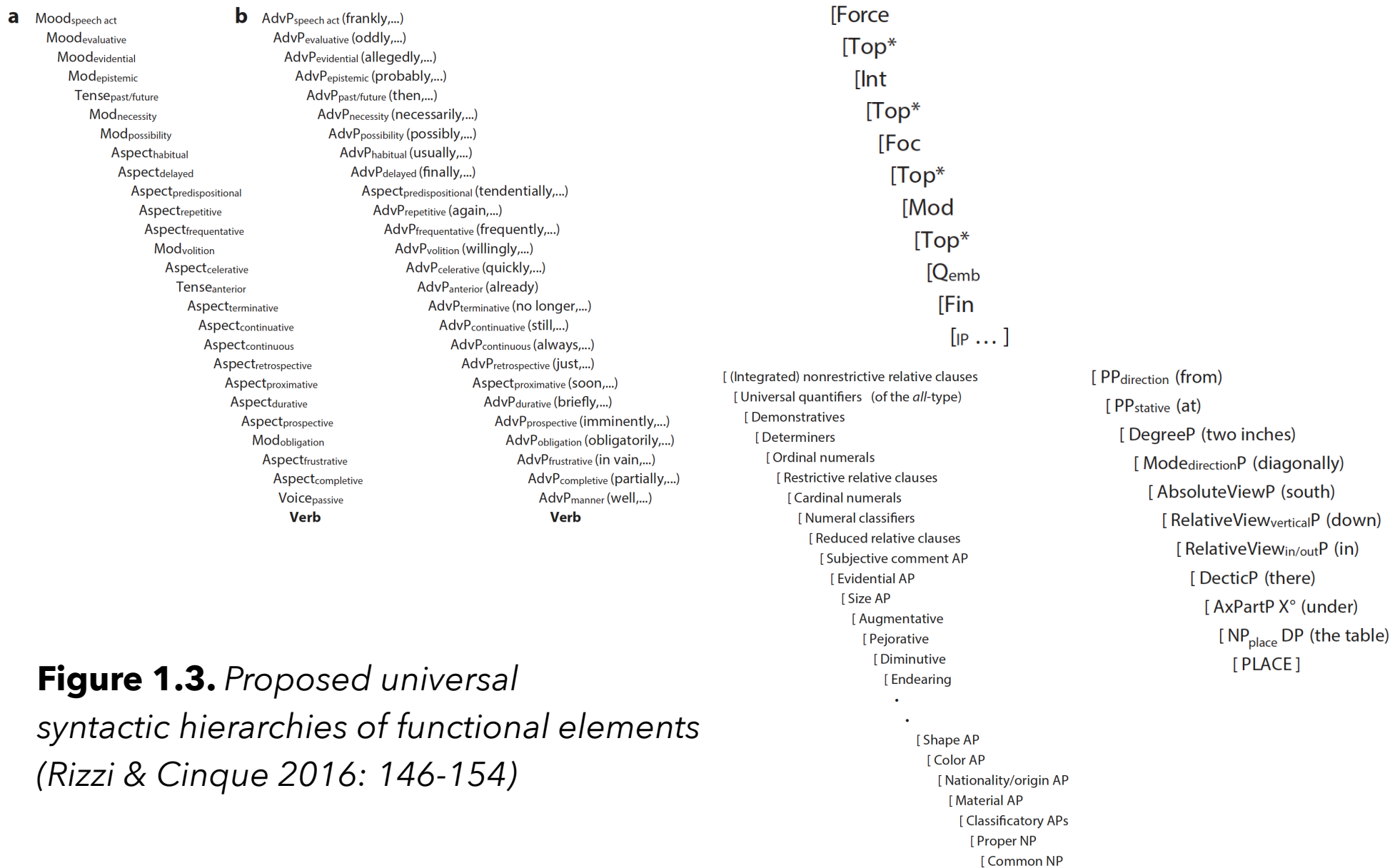


Figure 1.3. *Proposed universal syntactic hierarchies of functional elements (Rizzi & Cinque 2016: 146-154)*

- ▶ previous classifications: Cann 2000
 - ▶ functional categories can be defined in terms of language-specific distributional classes
 - ▶ vis-à-vis the major lexical categories V, N, A
 - ▶ which Cann assumes to be universal

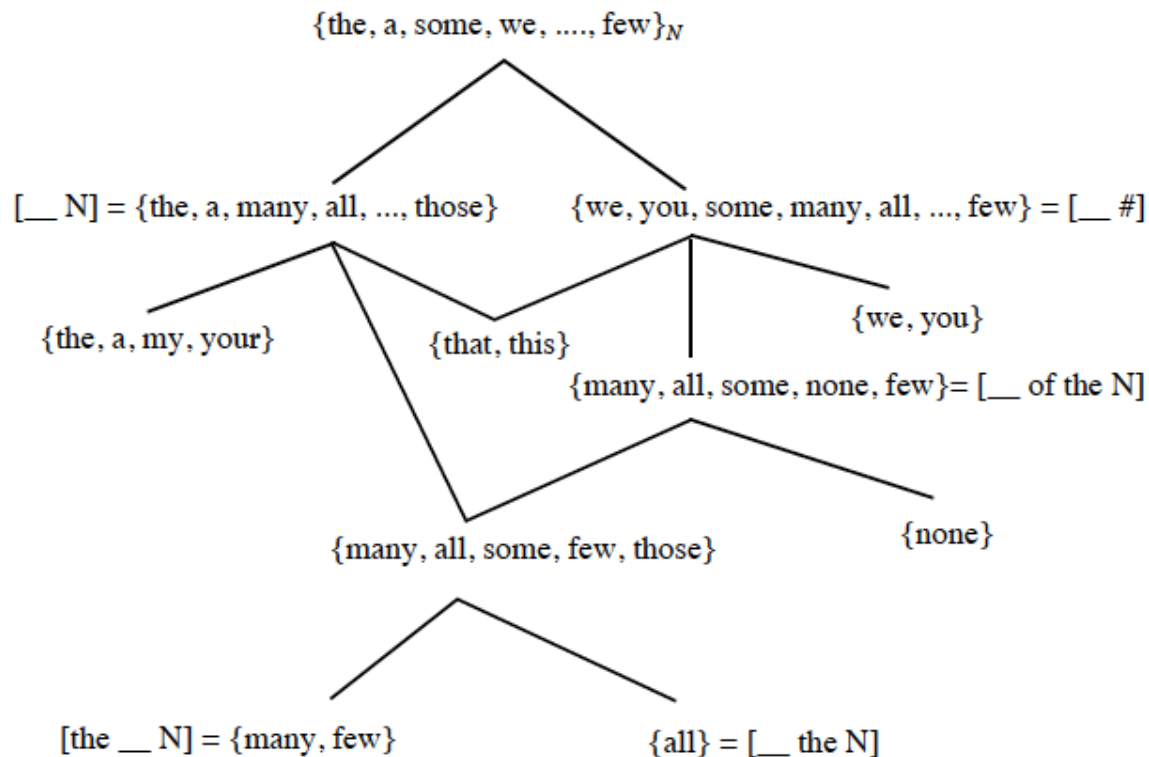


Figure 1.4. Lattice representing a taxonomy of nominal functional categories of English defined in terms of distributional classes (Cann 2000: 18)

▶ previous classifications: Muysken 2008

	Shifters	Linkers	Projectors
Determiners	+		
Person agreement	+		+
Tense markers	+		+
Modals		+	
Pronouns	+		
Demonstratives	+		
Question words	+		
Quantifiers	+		
Prepositions		+	
Conjunctions		+	
Complementisers		+	+
Connectives and particles		+	

Figure 1.5. “Crude sub-classification of functional categories”
(Muysken 2008: 16)

► toward a new classification

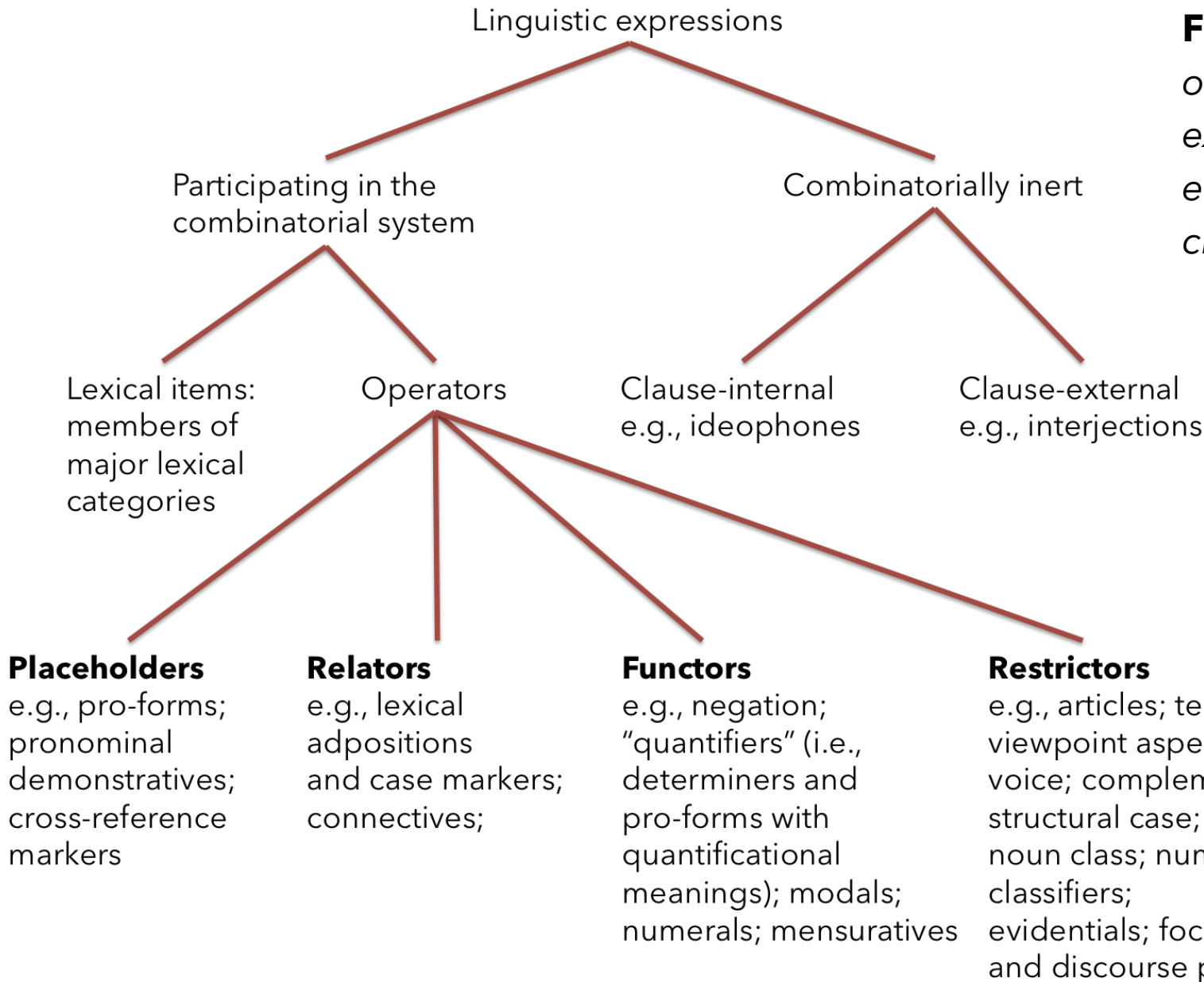


Figure 1.6. A taxonomy of natural language expressions, with special emphasis on the classification of operators

- ▶ the rationale behind the classification of operators

Table 1.3. *Distinctive properties of the operator types (communicative function is treated as definitional, ‘information status’ as criterial/diagnostic; the remaining properties are hypothetical explananda of the account)*

	Placeholders	Functors and relators	Restrictors
Examples	Pro-forms; pronominal demonstratives; cross-reference markers	Lexical adpositions and case markers; connectives; negation; “quantifiers” (i.e., determiners and pro-forms with quantificational meanings); modals; numerals; mensuratives	Articles; tense; viewpoint aspect; mood; evidentials; voice; complementizers; structural case; gender / noun class; number; classifiers; focus and discourse particles; honorifics
Primary communicative function	Metalinguistic: index a search domain for retrieving a referent; represent this referent in the utterance	Object-linguistic: express components of the speaker’s communicative intent that fall outside major ontological classes/semantic types	Metalinguistic: disambiguate reference and interactional stance, reducing the hearer’s inferential load
Information status	Referent may be at-issue content; search domain and existence of referent are necessarily backgrounded	May express at-issue content depending on where they appear in the utterance	Necessarily backgrounded
Grammaticalization	Weak (depending on form class)	Weak (depending on form class)	Strong (depending on form class)
Typologically variation in grammaticalization	Intermediate	Weak (numerous near-universals)	Strong

- ▶ the rationale behind the classification of operators (cont.)
 - ▶ functors and relators express part of the speaker's communicative intent

- ▶ the reason they're not members of the major lexical categories is their combinatorial properties
 - ▶ reflected in their semantic types

Lexical and phrasal categories		Functors and relators	
Proper nouns, pronouns	e	Numerals, mensuratives	$\langle\langle e,t\rangle, \langle e,t\rangle\rangle$
Non-relational common nouns, standard-form predicative adjectives, intransitive verbs, VPs	$\langle e,t\rangle$	Lexical adpositions	$\langle\langle\langle e,t\rangle, t\rangle, \langle e,t\rangle\rangle$
NPs headed by common nouns	$\langle\langle e,t\rangle, t\rangle$	Determiners	$\langle\langle e,t\rangle, \langle\langle e,t\rangle, t\rangle\rangle$
Relational common nouns, comparative-form predicative adjectives, transitive verbs	$\langle e, \langle e,t\rangle\rangle$	Modals, VP negation	$\langle\langle e,t\rangle, \langle\langle\langle e,t\rangle, t\rangle, t\rangle\rangle$
Ditransitive verbs	$\langle e, \langle e, \langle e,t\rangle\rangle\rangle$	Sentential negation	$\langle t,t\rangle$
Attributive adjectives, relative clauses	$\langle\langle e,t\rangle, \langle e,t\rangle\rangle$	Coordinative conjunctions	$\langle t, \langle t,t\rangle\rangle$
Clauses, sentences	t		

Table 1.4. *Standard-issue extensional Montegovian type system for English sans events/situations*

- ▶ the rationale behind the classification of operators (cont.)
 - ▶ placeholders represent referents that are part of the speaker's intended message
 - ▶ and thus potentially at-issue content
 - ▶ however, their *semantic* meanings are "search domains" that do not form part of the intended message
 - ▶ and are necessarily backgrounded
(Kaplan 1989; Bohnemeyer 2015)

(1.1) [Looking at the faculty page of UB Linguistics: Q: Who is the guy who started RRG? - A, pointing at RVV's pic:]

THIS is / the founder of RRG / Robert Van Valin / Van

at-issue content: the pic pointed to shows RVV, (one of) the founder(s) of RRG

backgrounded: the pic in question is being drawn selected attention to by the combination of the pointing gesture and the demonstrative

- ▶ the rationale behind the classification of operators (cont.)
 - ▶ restrictors do not express any part of the speaker's intended message
 - ▶ their expression is instead generally compelled by the grammar
 - ▶ and they arguably serve to facilitate comprehension by reducing ambiguities
 - ▶ simple illustration: gender

(1.2) *Floyd_i encontró a Sally_j enojos-**o_i**/**-a_j***

SPA Floyd encountered Sally annoyed-M.SG/-F.SG

'Floyd_i found Sally_j annoyed_{i/j}' [constructed]

- ▶ the rationale behind the classification of operators (cont.)
 - ▶ a more complex example: tense

(1.3) [Q: *What happened at Sheila's party last Friday?*]

A: *Sam got drunk* [constructed after Partee 1984: 245]

- ▶ the past tense in (1.3) is not informative
 - ▶ it merely introduces a presupposition to the effect that the utterance concerns a specific past **topic time**

Topic time (Klein 1994): Every utterance, with the exception of generics, makes an assertion or asks a question or issues a command (etc.) about a specific situation. The utterance's **topic time** is the time of that situation.

- ▶ the rationale behind the classification of operators (cont.)
 - ▶ this presupposition serves as a coherence device

(1.4) *Sheila had a party last Friday and Sam got drunk*
 (Partee 1984: 245)

(1.5) John got up, went to the window, and raised the blind.

e_1 e_2 e_3

It was light out. He pulled the blind down and went back to bed.

s_1 e_4 e_5

He wasn't ready to face the day. He was too depressed.

s_2 s_3

(Partee 1984: 254)

e_1	e_2	e_3	e_4	e_5	s_1	s_2	s_3	r_s
·	·	·	·	·	·	·	·	·
$e_1 < e_2 < e_3 < e_4 < e_5 < r_s$								
John get up (e_1)								
⋮								
John go back to bed (e_5)								
s_1	0	e_3						
s_2	0	e_5						
s_3	0	e_5						
It be light out (s_1)								
⋮								
John be too depressed (s_3)								

The topic time of an utterance is distinct from the **situation/event times** of the lexical event descriptors it might contain. For example, the topic times of (1.5) are properly contained in the situation times of the stative clauses.

- ▶ the rationale behind the classification of operators (cont.)
 - ▶ the topic time presuppositions of tenses are analogous to the antecedent presuppositions of pronouns
 - ▶ Partee (1973, 1984); Kratzer 1998; *inter alia*
 - ▶ the temporal relation expressed by the tense marker *constrains* this topic time
 - ▶ the way a pronoun's gender *constrains* its referent

- ▶ can tenses express at-issue content? - nope!

(1.6) [Q: *Has Floyd finished his paper on operators?* - A: *No, but he WILL finish it!* [constructed (duh!)]

- ▶ stress on the auxiliary marks verum “focus” in (1.6)
 - ▶ which is arguably not focus at all, but a *sui-generis* operator that bridges between (1.6) and its QuD
 - ▶ cf. Gutzmann et al (ms.)
- ▶ the content of tense morphemes is necessarily backgrounded
 - ▶ it cannot be focalized and can never be at-issue content

- ▶ are the differences between the operator types categorical?
 - ▶ I doubt it!
 - ▶ my assumption is that there are three continua

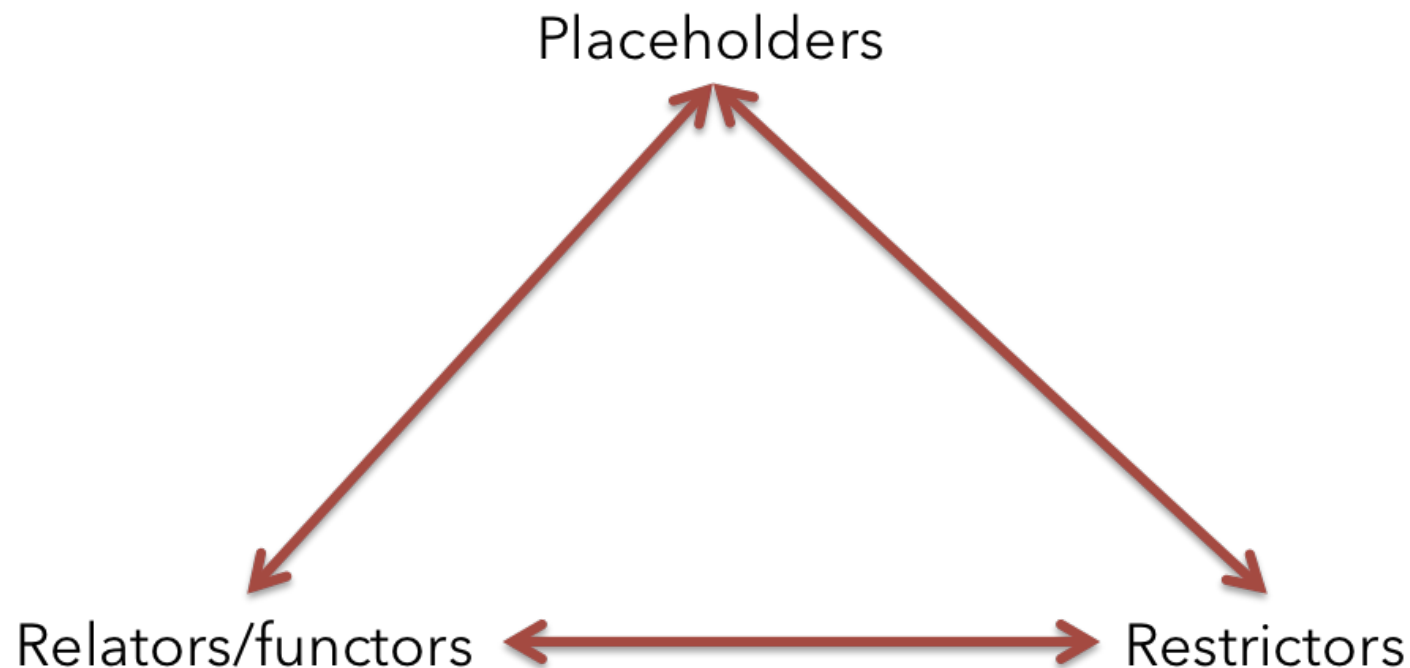


Figure 1.7. *Graded transitions between operator types*

- ▶ example: numeral classifiers
 - ▶ Yucatec has three 'inherent-state' (Berlin 1968) numeral classifiers
 - ▶ which divide the entire nominal domain exhaustively into
 - ▶ humans and (higher) animals (*túul*)
 - ▶ living plants, mushrooms, and hair (*kúul*)
 - ▶ inanimates (*p'éel*)
 - ▶ these never express at-issue content

(1.7) Ts'a' tèn **hun-p'éel/#mòok** su'm!
 give(IMP) me one-CL.IN/CL.knot rope
 'Give me a rope!' [constructed]

- ▶ example: numeral classifiers (cont.)
 - ▶ however, in addition, Yucatec and other Mayan languages have a large form class
 - ▶ of 'temporary state classifiers' (Berlin 1968) which appear in the same morphological position
 - ▶ these are non-redundant and primarily used predicatively

(1.8) Le=su'm=o' **ka'-mòok** yàan-ik.
 DEF=rope=D2 two-CL.knot EXIST-EF(B3SG)
 'The rope, it is two-knotted
 (i.e., there are two knots in it).' [elicited]

- ▶ tentatively, on the proposed classification
 - ▶ inherent-state classifiers are restrictors
 - ▶ temporary-state classifiers are functors

- ▶ an evolutionary model of the grammaticalization of restrictors

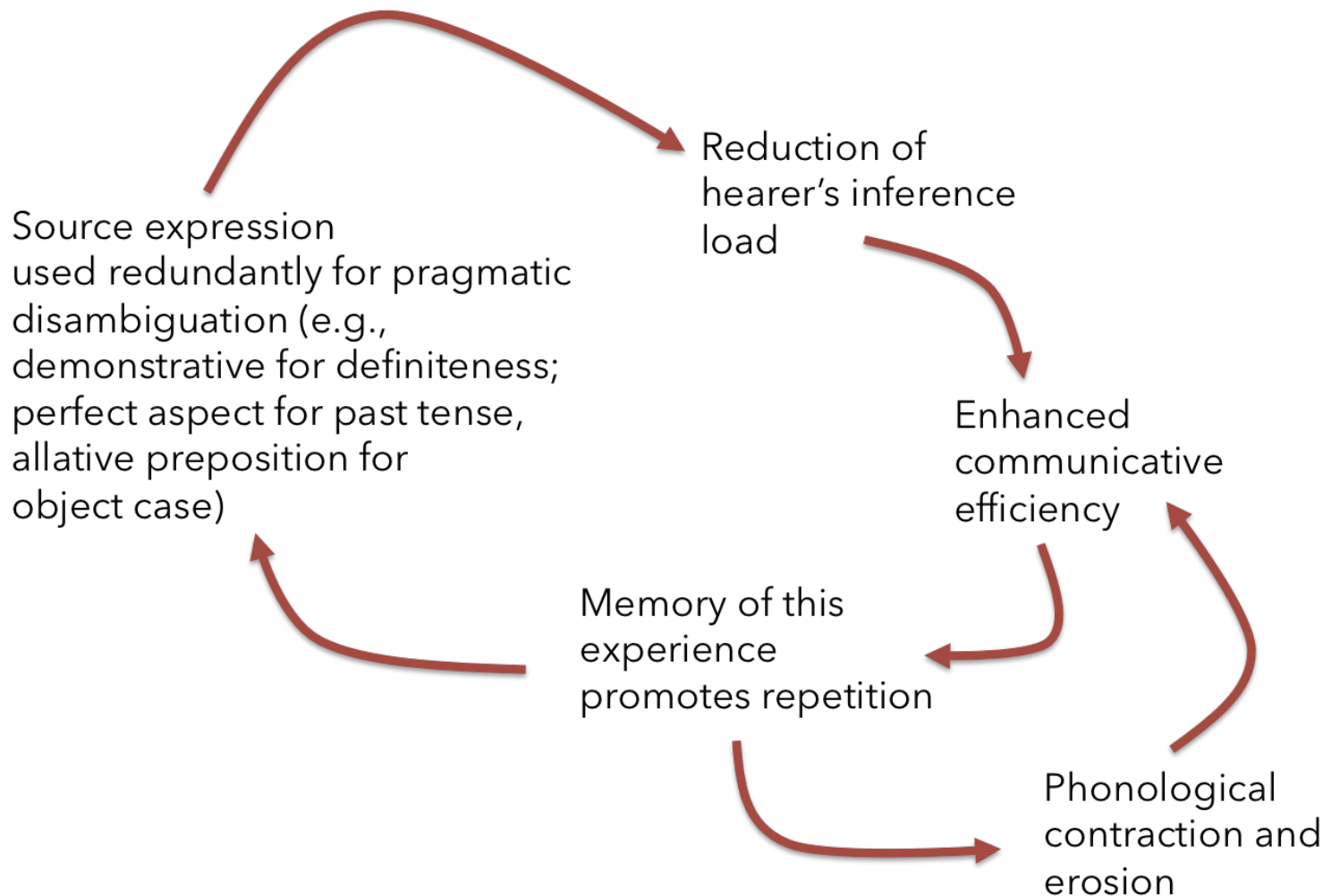


Figure 1.8. *The grammaticalization of restrictors as an evolutionary process*

- ▶ what the evolutionary model is meant to explain
 - ▶ restrictors show strong evidence of grammaticalization
 - ▶ out of sources that belong to distinct categories: lexical items, functors/relators, or other restrictors
 - ▶ unlike the other three types of operators
 - ▶ there is an enormous amount of crosslinguistic variation in the presence of particular restrictor types
 - ▶ unlike in the case of the other three types of operators
 - ▶ several semantic functor/restrictor types actually appear to be expressed nearly universally
 - ▶ e.g., negation, quantification

► evidence for cross-linguistic variation: WALS

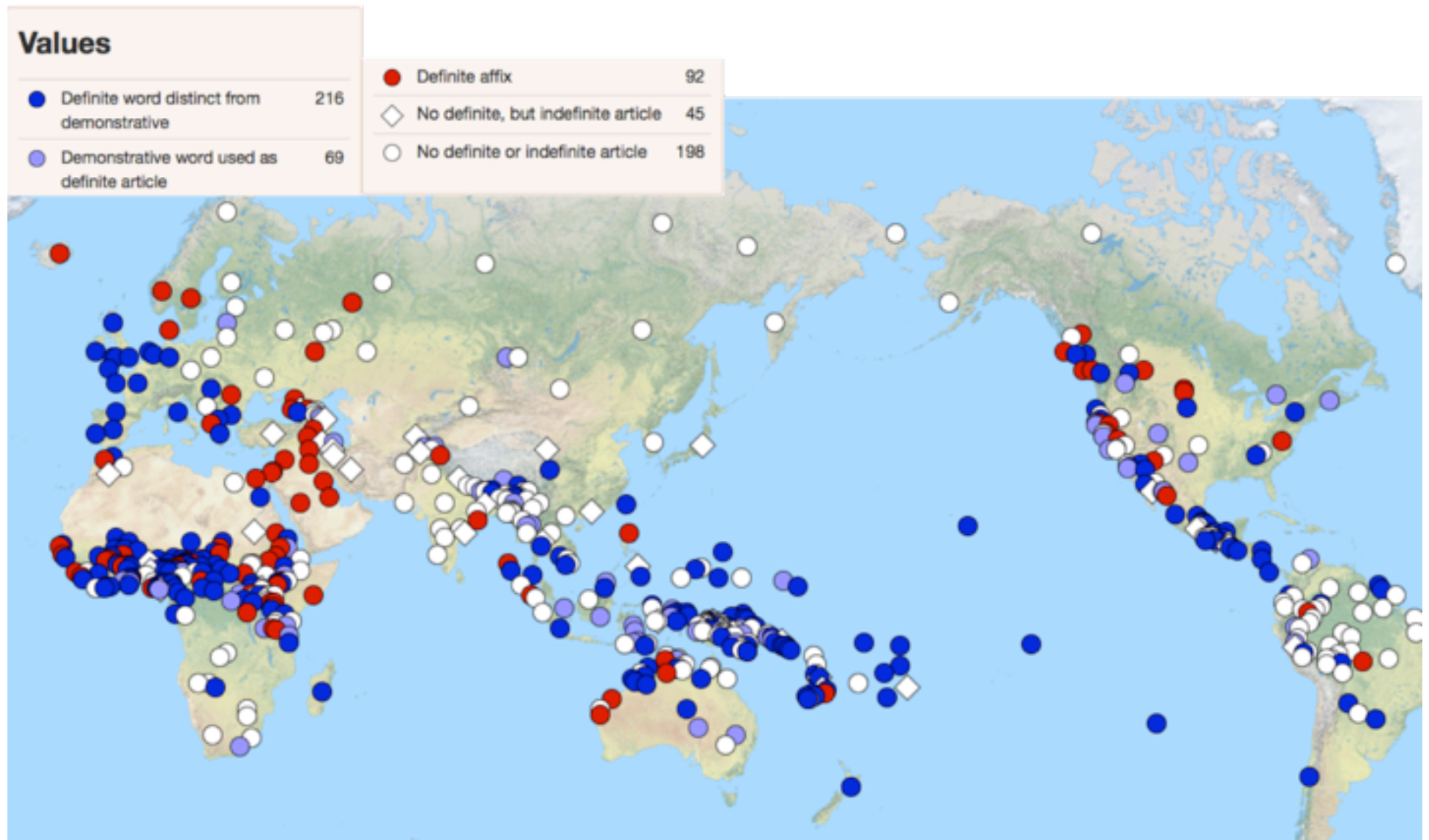


Figure 1.9. *Distribution of definiteness markers in WALS (Dryer 2013)*

► evidence for cross-linguistic variation: WALS (cont.)

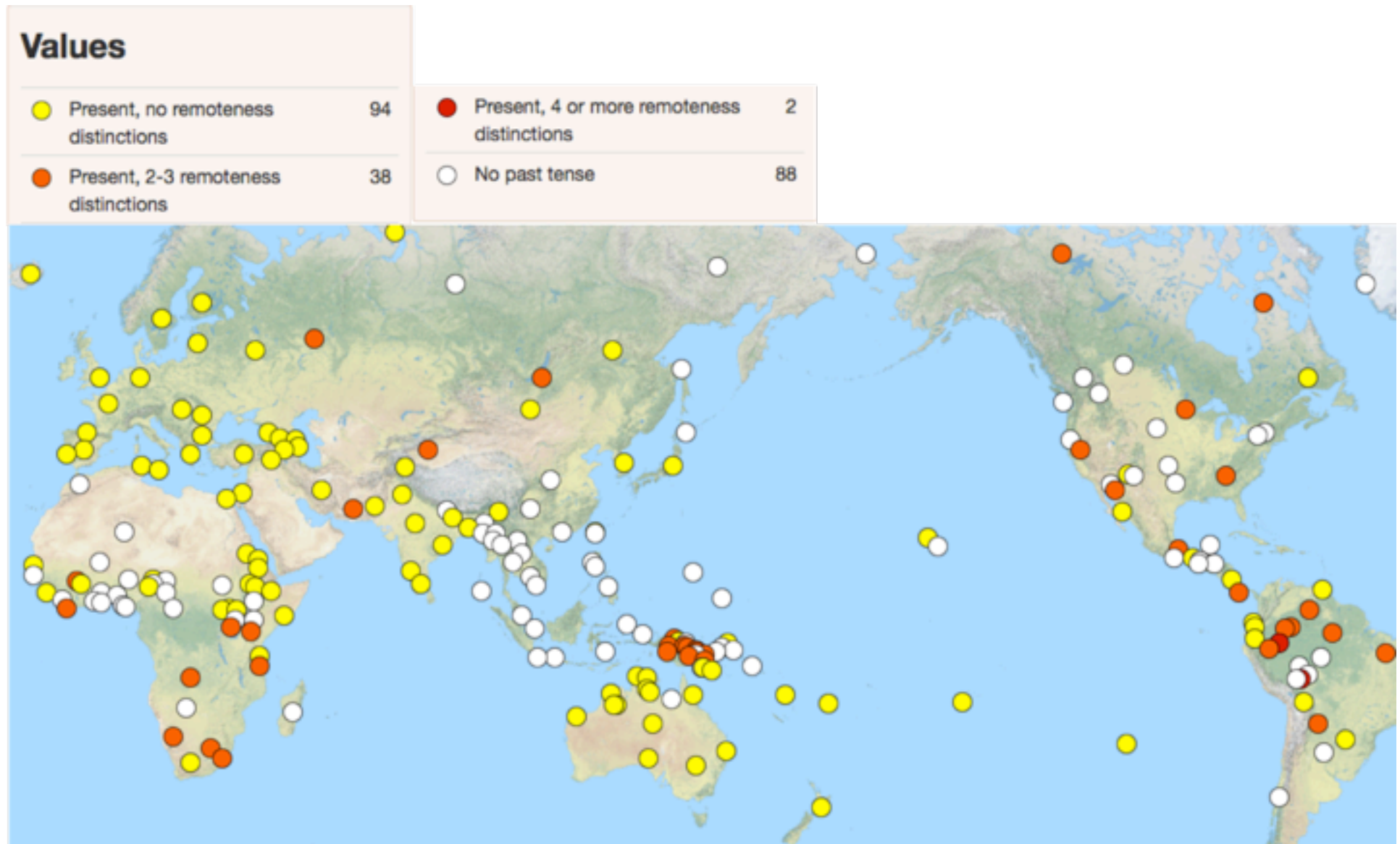


Figure 1.10. *Distribution of past tense markers in WALS (Dahl & Velupillai 2013)*

► evidence for cross-linguistic variation: WALS (cont.)

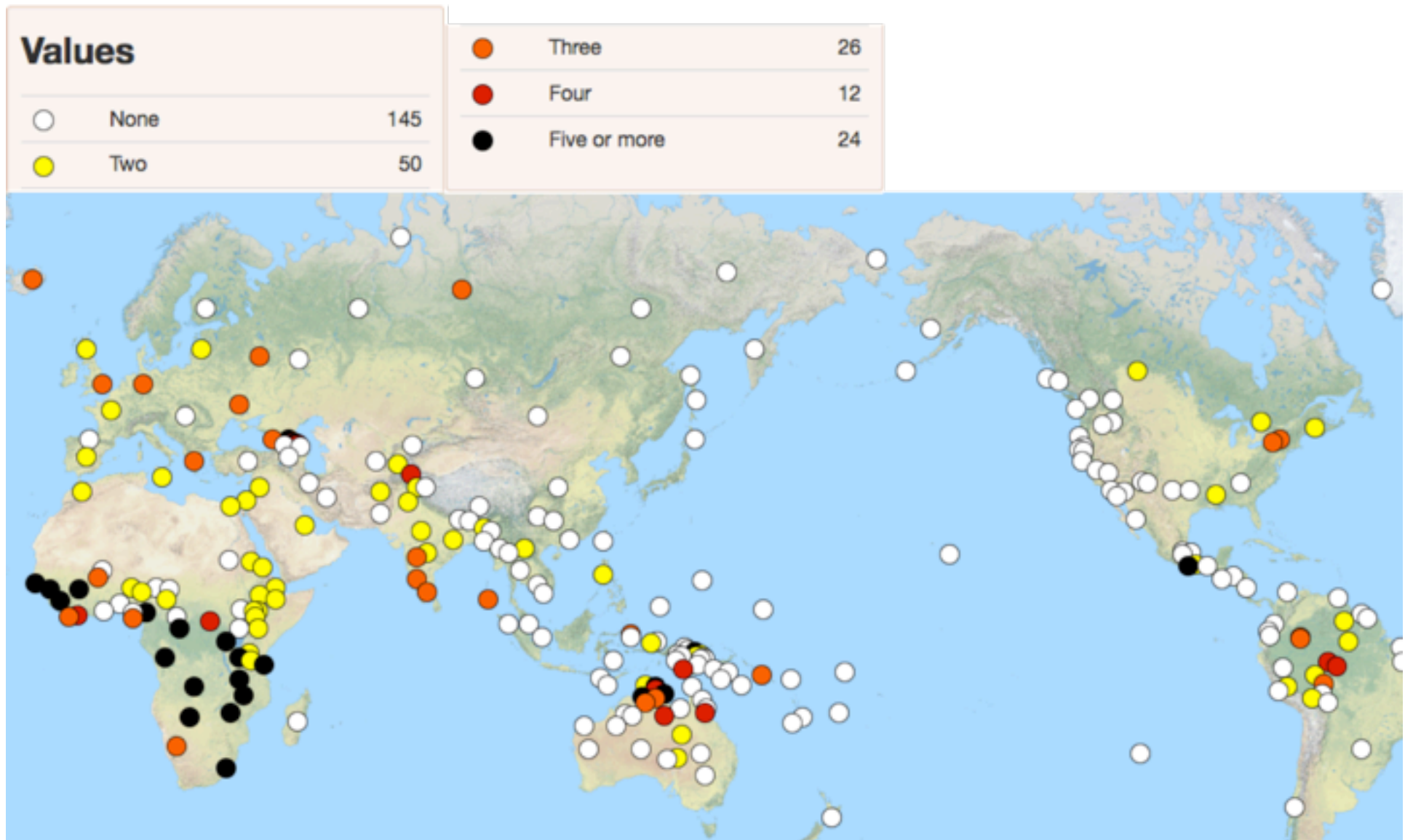


Figure 1.11. *Distribution of gender/noun class markers in WALS (Corbett 2013)*

► evidence for cross-linguistic variation: WALS (cont.)

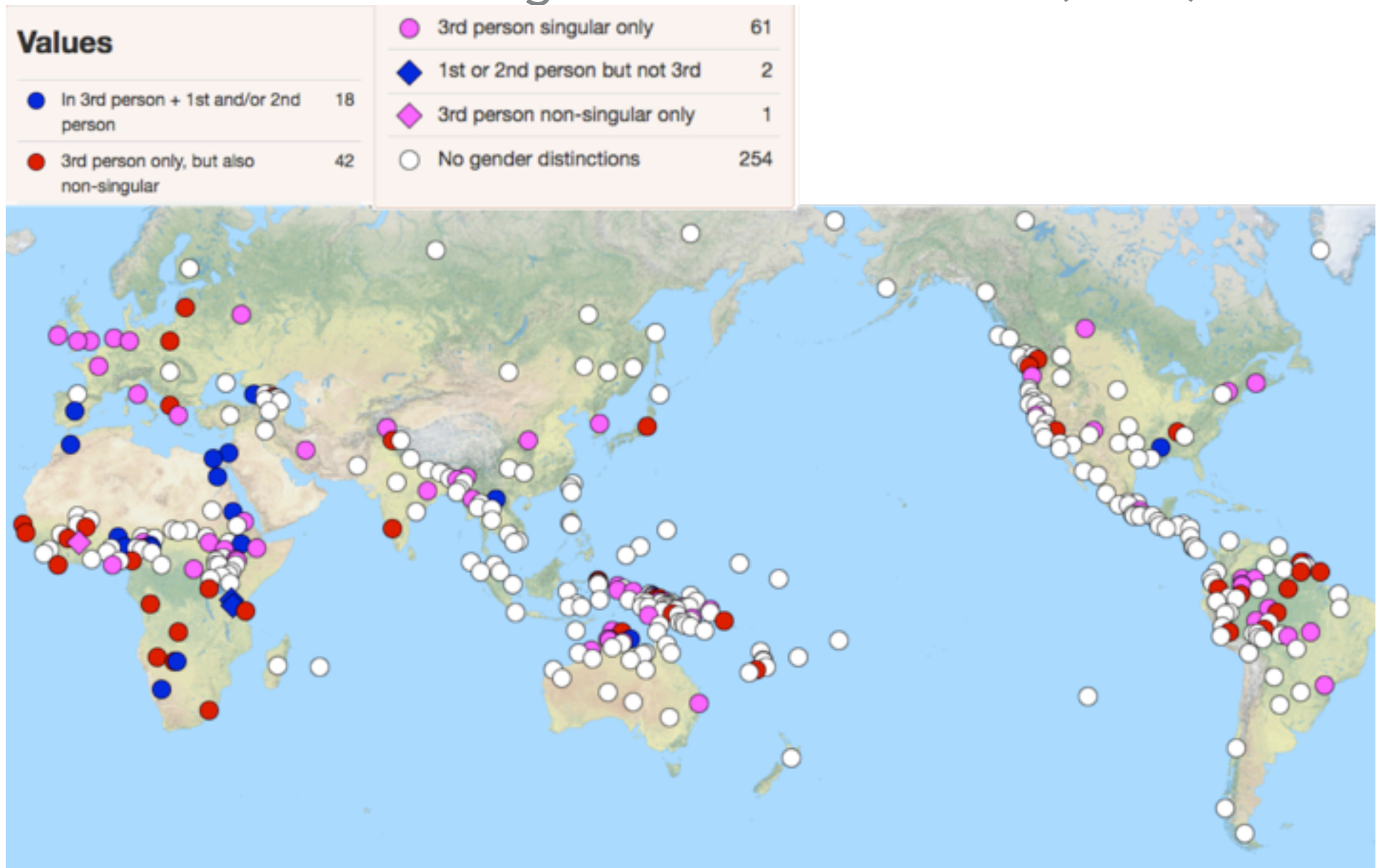


Figure 1.12. Gender marking in independent pronouns in WALS (Siewierska 2013)

SYNOPSIS

- ▶ Operators: an evolutionary approach
- ▶ Operator projections: implications
- ▶ Unified theories of TAM
- ▶ The proper treatment of TAM in RRG
- ▶ The case for finiteness
- ▶ Summary

OPERATOR PROJECTIONS: IMPLICATIONS

- ▶ *What you see is what you get*
 - ▶ *What you don't see isn't there*
 - ▶ *unless it's defined by contrast*
 - ▶ the evolutionary model severely restricts the possibility space for null operators - especially null restrictors
- ▶ considerable language-specificity in what is expressed
 - ▶ again, especially when it comes to restrictors

Abbreviations: **CP** for **constituent projections**; **OP** for **operator projections**.

- ▶ grammaticalization of restrictors is arguably the primary piece of evidence motivating the existence of OPs
 - ▶ functors/relators and placeholders can be assigned traditional semantic types
 - ▶ suggesting they participate in the ordinary combinatorial system, i.e., are CP constituents
 - ▶ it is specifically the grammaticalization of restrictors that creates mismatches
 - ▶ between where restrictor morphemes appear in the surface structure
 - ▶ and where they enter the semantic composition

- ▶ what can we gain from OPs?
 - ▶ possibly, a compositional semantics of operators directly working off the OP
 - ▶ which would simplify the analysis of sentence meaning enormously!

SYNOPSIS

- ▶ Operators: an evolutionary approach
- ▶ Operator projections: implications
- ▶ Unified theories of TAM
- ▶ The proper treatment of TAM in RRG
- ▶ Summary

UNIFIED THEORIES OF TAM

- ▶ Reichenbach (1947: 287-298): complex tenses of English encode ternary ordering relations
 - ▶ among 'speech point', 'event point', and 'reference point'
- ▶ Comrie (1981), Declerck (1991), Hornstein (1990), Ogihara (1996), *inter alia*: 'neo-Reichenbachian' theories
 - ▶ decomposing Reichenbach's ternary relations into pairs of binary relations
- ▶ Klein (1992, 1994): neo-Reichenbachian theory reinterpreting reference time as **topic time**
 - ▶ and extending the theory to cover **viewpoint aspect**

► terminological intermezzo

Situation aspect (Smith 1991): the temporal properties of a situation *type* as described by lexical event descriptors and their syntactic projections.

Viewpoint aspect (Smith 1991): the temporal perspective an utterance takes on a described particular (except for habitual and generic reference) situation. Alternative terms in the literature include 'grammatical aspect' and 'propositional aspect' (both of which are awful).

► the terms 'situation aspect', 'lexical aspect', and 'aktionsart' are commonly treated as synonymous - **not so here!**

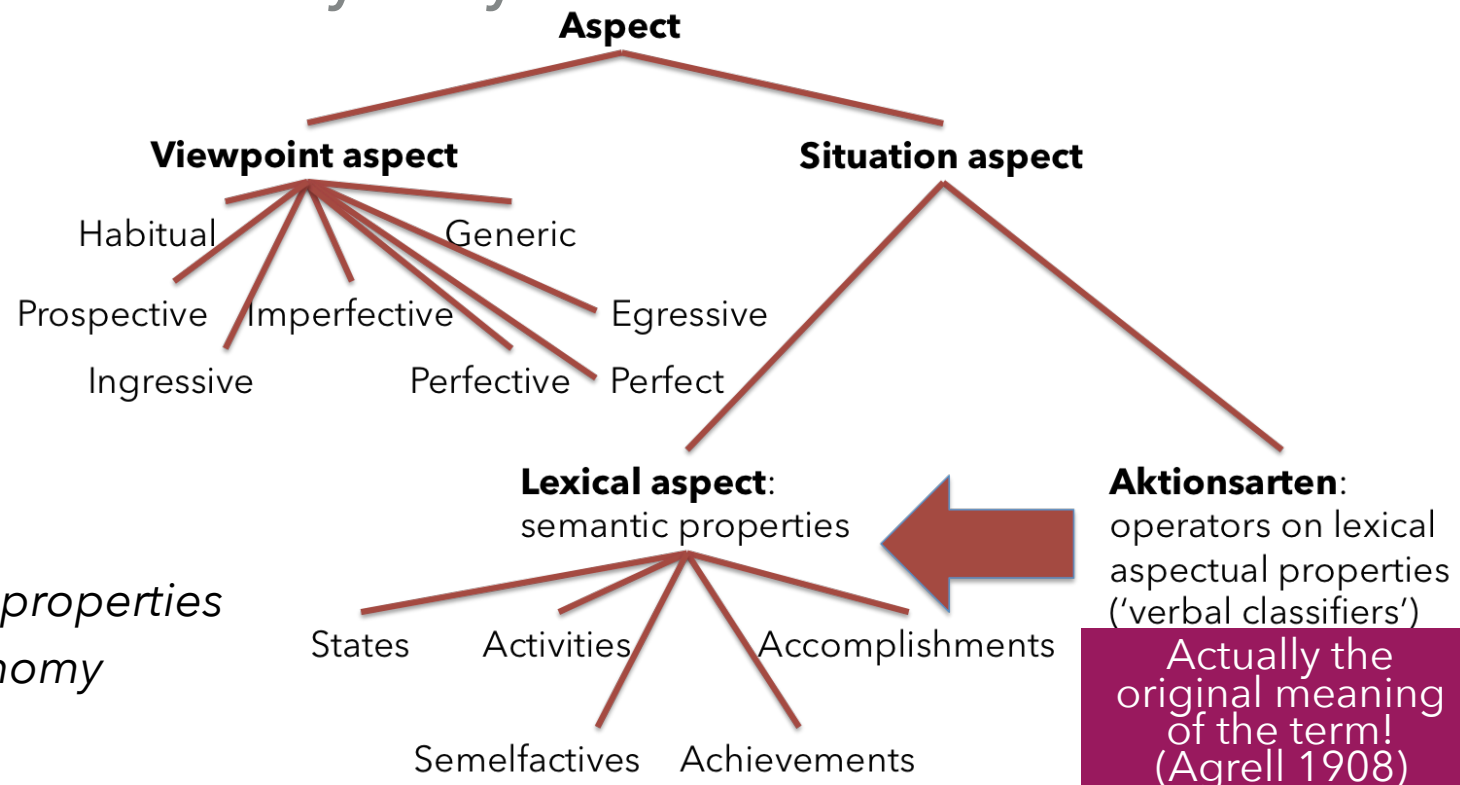


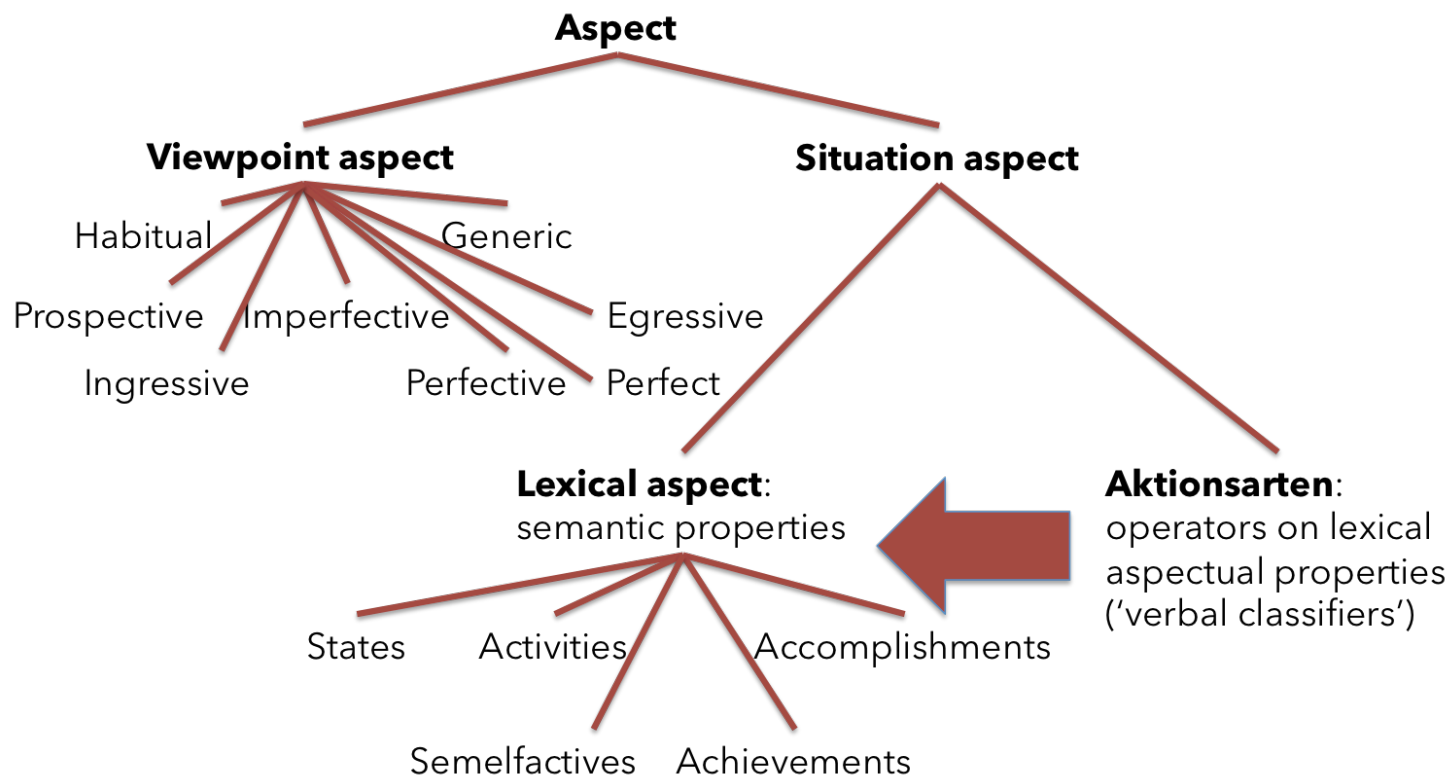
Figure 3.1. Aspectual properties and operators - a taxonomy

► terminological intermezzo (cont.)



“By ‘aktionsart’ I mean ... not the two main categories of the slavic verb, the incomplete and complete action forms (the imperfective and perfective) - these I call ‘aspects’. With the term ‘aktionsart’ I designate semantic functions of the complex verbs (and a few base forms and suffixal formations) which specify further how the action is conducted, the manner of its execution. These have heretofore received little attention, let alone been classified.”
(Agrell 1908: 78; translation JB)

Figure 3.2. Sigurd Agrell
(1881-1937) (source:
Wikipedia)



▶ Klein's big idea, Part I

- ▶ viewpoint aspect can be understood in terms of temporal relations between topic time and situation time
- ▶ it's this relation that defines the aspectual perspective
 - ▶ and it's topic time that defines the viewpoint

(3.1)[Context: investigator eliciting witness testimony]

- a. *What did you notice when you entered the room?*
- b. *A man was lying on the floor.*
- c. *He was Chinese or Japanese.*
- d. *He did not move.*
- e. *A woman was bending over him.*
- f. *She was taking a purse from his pocket.*
- g. *She turned to me.* (Klein 1994: 39-40)

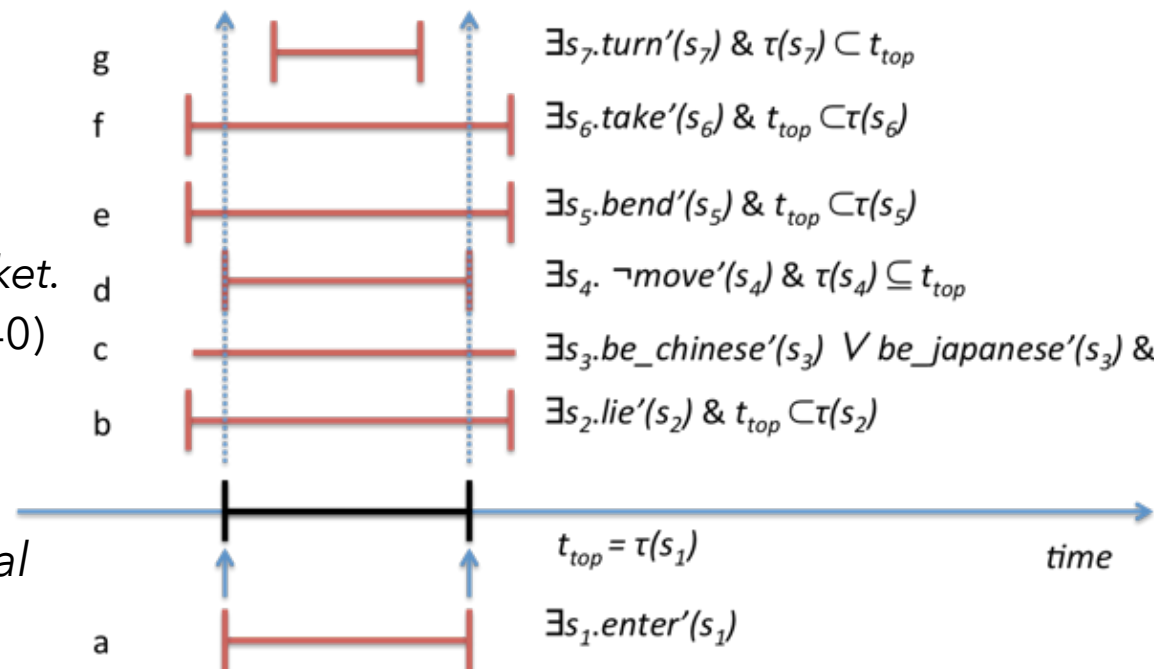


Figure 3.3. Diagramming the temporal structure of (3.1)

- ▶ Klein's big idea, Part II
 - ▶ since viewpoint aspect already relates topic time to situation time
 - ▶ tense does not need to access situation time at all
 - ▶ instead, it relates topic time to utterance time
 - ▶ this makes the correct predictions for state descriptions (e.g., (2.1.c-d))

Table 3.1. Klein's (1994) analysis of the English tense-aspect system (key: t_{top} - topic time (projection range); $\tau(e)$ - situation time (the runtime of the described eventuality); t_u - utterance time)

Tense Relation Aspect Relation	Past $t_{top} < t_u$	Present $t_u \subset t_{top}$	Future $t_u < t_{top}$
Perfective $\tau(e) \subseteq t_{top}$	Simple Past <i>I wrote</i>	Present <i>I write</i>	Simple Future <i>I will write</i>
Imperfective $t_{top} \subset \tau(e)$	Past Progressive <i>I was writing</i>	Present Progressive <i>I am writing</i>	Future Progressive <i>I will be writing</i>
Perfect $\tau(e) < t_{top}$	Pluperfect <i>I had written</i>	Present Perfect <i>I have written</i>	Future Perfect <i>I will have written</i>
Prospective $t_{top} < \tau(e)$	Past Prospective <i>I was going to write</i>	Present Prospective <i>I am going to write</i>	Future Prospective <i>I will be going to write</i>

- ▶ a simpler version of these ideas had simultaneously been discovered by scholars in Discourse Representation Theory
 - ▶ cf. Kamp (1979); Kamp & Rohrer (1983); Kamp & Reyle (1993); Kamp et al. (2011)
- ▶ differences
 - ▶ instead of 'topic time', the DRT tradition adopted an anaphoric version of Reichenbach's 'reference point'
 - ▶ the treatment of aspect is reduced
 - ▶ to a distinction between 'event reference' (= perfective) and 'state reference' (= imperfective)

- ▶ the DRT approach has dominated the treatment of tense and aspect in dynamic semantics
 - ▶ while Klein's approach has been widely adopted in non-dynamic work in formal semantics
 - ▶ e.g., Arche (2013); Bohnemeyer (2014); Bohnemeyer and Swift (2004); Demirdache and Uribe-Etxebarria (2004, 2007); Stowell (2007)

- ▶ some expansions
 - ▶ Bohnemeyer (2014): on typological grounds, true relative/anaphoric tenses exist
 - ▶ and have semantic properties distinct from those of viewpoint aspects
 - ▶ Bohnemeyer (in press), Cable (2013): temporal remoteness markers (a.k.a. 'metrical' tenses) aren't tenses
 - ▶ or at least not in all languages
 - ▶ their semantics seems to be closer to that of aspects
 - ▶ Bohnemeyer (2012, 2016): the semantics of mood markers (subjunctive/irrealis) can likewise be expressed
 - ▶ in terms of temporal relations
b/w situation time and topic time

SYNOPSIS

- ▶ Operators: an evolutionary approach
- ▶ Operator projections: implications
- ▶ Unified theories of TAM
- ▶ The proper treatment of TAM in RRG
- ▶ Summary

THE PROPER TREATMENT OF TAM IN RRG

► the current treatment

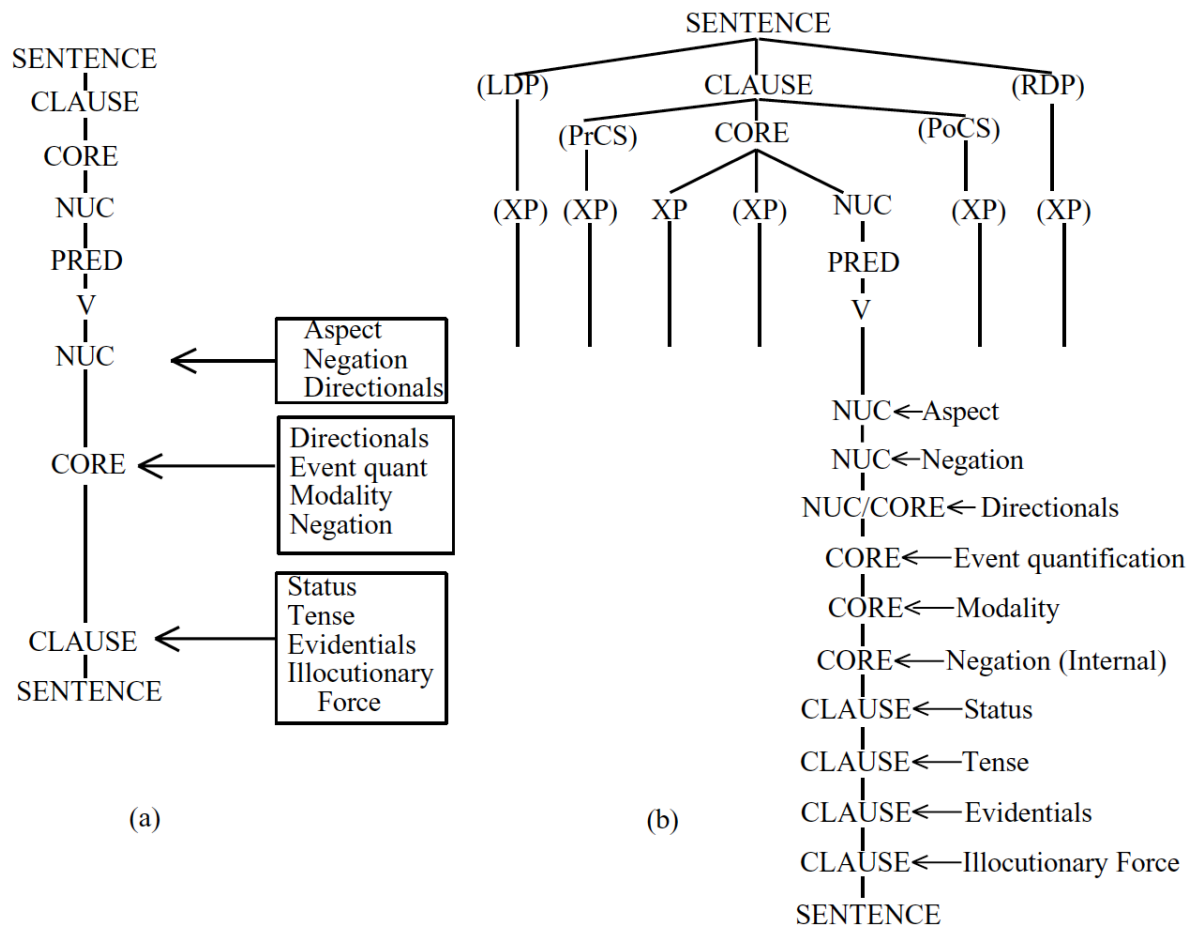


Figure 4.1. Layered structure of the clause with constituent and operator projections (Van Valin 2005: 12)

► desiderata

- event quantification, negation, modality could also be encoded in the CP, since they are functors
- missing: mood (but there is 'status'); viewpoint aspect vs. aktionsart
- I'm going to propose treating finiteness as an operator

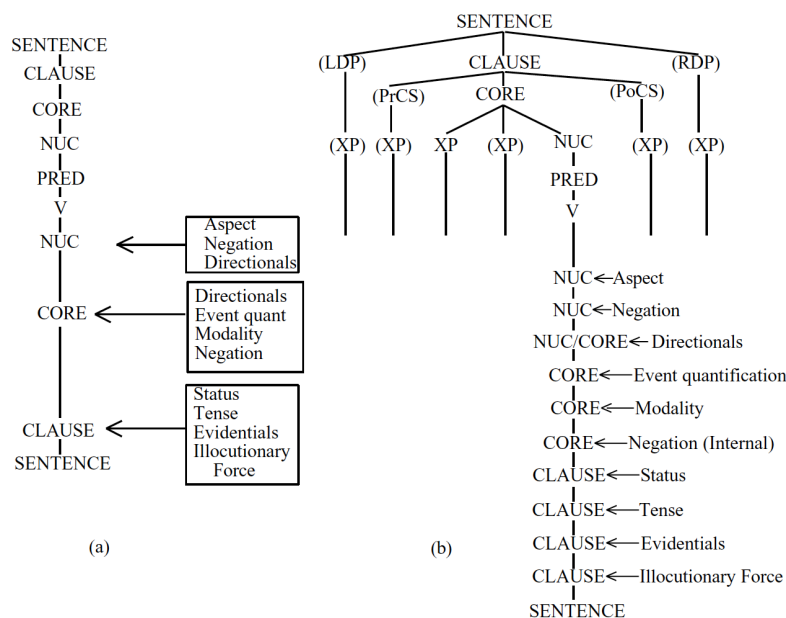


Figure 4.1. Layered structure of the clause with constituent and operator projections (Van Valin 2005: 12)

- ▶ evidence bearing on the position of operators in the OP
 - ▶ the operator's surface position relative to that of other operators (e.g., Bybee 1985)
 - ▶ *yes, but* - surface order being potentially mismatched with semantic composition is the very reason
 - ▶ for postulating OPs in the first place!
- ▶ the semantic type of the operand
- ▶ the operator's association with CP layers of certain distributional properties
- ▶ the operator's input and output variables

- ▶ the type of the operand: an informal type system for the Layered Structure of the Clause

Table 4.1. *Semantic types associated with the LSC layers*

Layer	Semantic type	Example
Nucleus	Event type description (Parsons 1990)	Forget one's cue
(Verbal) core	Generic or individual event description	Floyd forgetting his cue <i>irritates Sally /</i> Floyd forgetting his cue last Friday <i>irritated Sally</i>
(Finite) clause	Proposition concerning the realization of an individual event (except for generics)	<i>Sally believed</i> that Floyd had forgotten/would forget his cue
Sentence	Speech act	Did Floyd forget his cue?

- ▶ the proper treatment of tense
 - ▶ the most compact layer at which tense contrasts are expressed is the clause

(4.1) Infinitival cores: no tense contrast expressible

a. ***Floyd forgetting his cue** irritates Sally*

b. ***Floyd forgetting his cue last Friday** irritated Sally*

(4.2) Finite complement clauses: tense contrast expressible

a. *Sally believed **that Floyd had forgotten his cue***

b. *Sally believed **that Floyd would forget his cue***

- ▶ the proper treatment of tense (cont.)
 - ▶ this makes sense morphologically since tense is a finiteness feature in Indo-European languages
 - ▶ it also makes sense semantically since deictic/absolute tense constrains topic time vis-à-vis utterance time
 - ▶ and topic time is a “discourse-level” variable in the sense that
 - ▶ every utterance is understood to have a unique topic time/situation at the speech act level
 - ▶ with the exception of generics
 - ▶ topic situations/times are tracked anaphorically in discourse

- ▶ the proper treatment of viewpoint aspect
 - ▶ viewpoint aspect relates the times of the situations described by nuclei and cores to the topic time
 - ▶ so it stands to reason that viewpoint aspect is expressed lower/closer to the nucleus than tense
 - ▶ and this is reflected in Minimalist adaptations of Klein's theory

- ▶ such as Demirdache & Uribe-Etxebarria 2007 and Stowell 2007

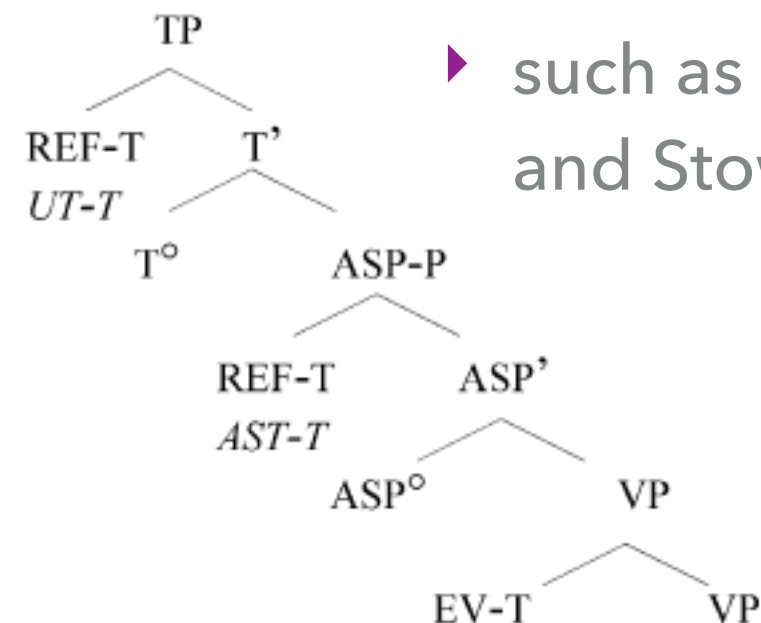


Figure 4.2. *“Isomorphic syntax of tense and aspect” (Demirdache & Uribe-Etxebarria 2007: 333)*

- ▶ the proper treatment of viewpoint aspect (cont.)
 - ▶ viewpoint aspect cannot be a nuclear-layer operator
 - ▶ since it operates on a complete event description
 - ▶ which is only encoded at the core layer

(4.1) *Floyd was eating three apples
when his phone rang and he stopped*

- ▶ at the topic time of (4.1), any of the stages in Figure 4.3
may hold

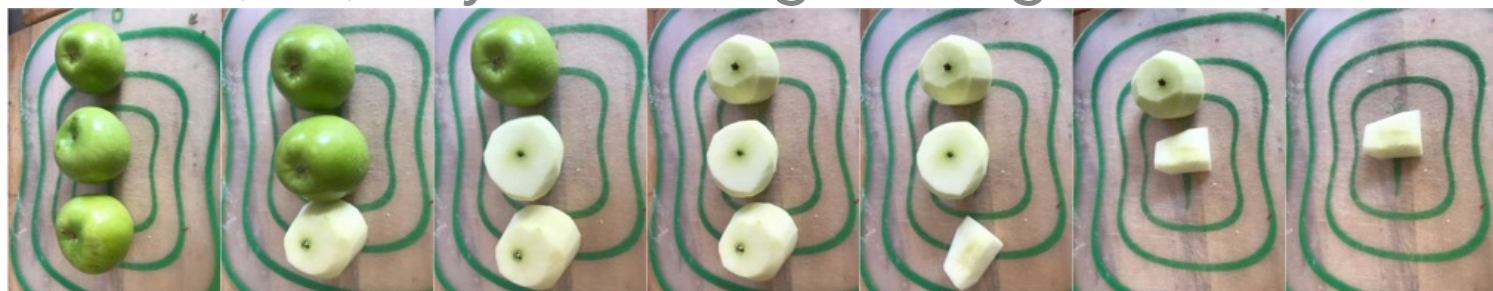


Figure 4.3. *A tale
of three apples*

- ▶ the issue here is not the order of operations
 - ▶ but the fact that the correct interpretation of (4.1) requires
application of the progressive=imperfective to the entire core

- ▶ so how did the idea originate that (viewpoint) aspect might be a nuclear operator?
 - ▶ could this have something to do with the typologically rather unusual aspect system of Slavic languages?
- ▶ excursus: aspect in Russian
 - ▶ the traditional picture
 - ▶ perfective aspect is expressed by a large set of verbal prefixes
 - ▶ unprefixed verbs are imperfective
 - ▶ prefixed verbs can express a 'secondary imperfective' by suffixation with *-iv/-yv*

- ▶ excursus: aspect in Russian (cont.)
 - ▶ prefixation is clearly lexical in terms of which prefixes are available with which verb bases
 - ▶ Janda et al. (2013, 2017): the prefixes are 'verbal classifiers'

	Meanings in Attracted Classes	Meanings in Neutral Classes	Meanings in Repulsed Classes
<i>pro-</i>	sound penetration, perdurative (SANDS)	penetrating surfaces, making holes (IMPACT)	saturation, penetration through holes (CHANGEST)
<i>po-</i>	factitive, delimitative, resultative (CHANGEST, SANDS)	factitive, resultative, delimitative (BEHAV)	resultative, delimitative (IMPACT)
<i>za-</i>	covering, filling, fixed states, attachment (IMPACT, CHANGEST)	————	fixed states (SPEECH, BEHAV)
<i>s-</i>	resultative, semelfactive (BEHAV)	resultative, semelfactive, together, down (CHANGEST, SPEECH, IMPACT)	————
<i>na-</i>	accumulation on surface (IMPACT, BEHAV)	accumulation of behavior (SPEECH)	accumulation that fills a volume (CHANGEST)

Table 4.2. *Semantic profiles of five common aktionsart prefixes in Russian (Janda et al. 2017: 242); SANDS = Sounds and speech; CHAGEST = Change of state/feature; IMPACT = physical impact)*

- ▶ excursus: aspect in Russian (cont.)
 - ▶ reanalysis: Klein (1995), Bohnemeyer & Swift (2004)

Verb stem class	Examples	Traditional analysis	Bohnemeyer & Swift 2004
Unprefixed stems w/o suppletive partners	<i>Kolot'</i> 'prick', <i>kryt'</i> 'cover', <i>igrat'</i> 'play', <i>pisat'</i> 'write'	Imperfective	Atelic, compatible w/ both imperfective and perfective interpretations
Unprefixed stems w/ suppletive partners	<i>Brosit'</i> 'throw', <i>dat'</i> 'give', <i>končit'</i> 'end', <i>past'</i> 'fall'	Stem suppletion expresses (im)perfective aspect	Stem suppletion expresses telicity; atelic stems are interpreted imperfectively, telic stems perfectly
Prefixed stems	<i>Vy-kolot'</i> 'thrust out', 'tattoo'; <i>ot-kryt'</i> 'open'; <i>pro-igrat'</i> 'lose'; <i>pere-pisat'</i> 'copy'	Perfective	Prefixes express aktionsart; most prefixes express telicity; telic verb stems are interpreted perfectly
Prefixed stems + -iv/-yv	<i>Vy-kal-yv-at'</i> 'be thrusting out/tattooing'; <i>ot-kr-yv-at'</i> 'be opening'; <i>pro-igr-yv-at'</i> 'be losing'; <i>pere-pis-yv-at'</i> 'be copying'	'Secondary imperfective'	The suffix -iv/-yv is the only primary morphological expression of viewpoint aspect in Russian

Table 4.3. *Heterodoxy: Bohnemeyer & Swift's (2004) reanalysis of the Russian aspect system*

- ▶ excursus: aspect in Russian (cont.)
 - ▶ on Bohnemeyer & Swift's analysis, viewpoint aspect is not lexical - not even in Russian
 - ▶ caveat: the nexus b/w telicity and perfectivity appears to be stronger than in Dutch and German
 - ▶ where B&S argue it to be an implicature
 - ▶ imperfective interpretations with prefixed verbs are strictly unavailable w/o the imperfective suffix

- ▶ the proper treatment of viewpoint aspect (resumed)
 - ▶ English core junctures do not generally permit the expression of aspectual contrasts

(4.2) a. *Floyd started to dance*

b. **Floyd started to be dancing*

c. **Floyd started to have danced*

(4.3) a. *Sally tried to open the door*

b. *??Sally tried to be opening the door when Sue arrived*

c. *?Sally tried to have opened the door by the time Sue arrived*

(4.4) a. *Sally forced Floyd to open the door*

b. *?Sally forced Floyd to be opening the door
when Sue arrived*

c. *?Sally forced Floyd to have opened the door
by the time Sue arrived*

▶ the proper treatment of viewpoint aspect (cont.)

- ▶ there are marginal exceptions in English

(4.5) *'Tis better to have loved and lost
than never to have loved at all*

- ▶ I'm unsure what to make of (4.5)

- ▶ so for the time being, I will refer to it
as the **Lord Alfred Exception (LAE)**

- ▶ it's possible to translate (4.5) literally
into German and Spanish

- ▶ but not into Russian and Yucatec

- ▶ so my hypothesis is that the LAE hinges on the availability
of a perfect aspect auxiliary inflected for tense



Figure 4.4. Lord Alfred

- ▶ the proper treatment of viewpoint aspect (cont.)
 - ▶ a more systematic exception: direct perception
- (4.6) a. *Floyd saw Sally walking across the street,
when suddenly she stopped midway and turned*
- b. *Floyd saw Sally walk across the street,
?when suddenly she stopped midway and turned*
- ▶ it seems that the event perception construction specifically allows expression of the aspectual contrast
 - ▶ and utilizes the morphological contrast between gerund and infinitive for this purpose

- ▶ the proper treatment of viewpoint aspect (cont.)
 - ▶ Russian appears to be more accommodating toward expressing aspectual contrasts in dependent cores
 - ▶ due in part to the nexus among perfectivity, telicity, and semantic definiteness

(4.7) a. Mužchin-a zastavi-l devuš-k-u pakova-t' vešč-i.

man-NOM.SGM force-PAST.SGM girl-ACC.SGF pack-INF thing-PL

'The man forced the girl to pack things.'

b. Mužchin-a zastavi-l devuš-k-u **u**-pakova-t' vešč-i.

man-NOM.SGM force-PAST.SGM girl-ACC.SGF **TEL**-pack-INF thing-PL

'The man forced the girl to pack the things / things completely.'

c. Mužchin-a zastavi-l devuš-k-u **u**-pakov-**yv**-at' vešč-i.

man-NOM.SGM force-PAST.SGM girl-ACC.SGF **TEL**-pack-**IMPF**-INF thing-PL

'The man forced the girl to pack the things repeatedly / by some protracted, repetitive process.'

▶ the proper treatment of viewpoint aspect (cont.)

(4.8) a. Ona pyta-l-as' otkry-t' dver'.

she(NOM) try-PAST-REFL.F open-INF door(ACC.SGF)

'She tried to open the door.'

b. Ona pyta-l-as' otkry-**yv**-at' dver'.

she(NOM) try-PAST-REFL.F open-**IMPF**-INF door(ACC.SGF)

'She tried to open the door' = 'She tried to see whether the door would open even slightly'

▶ however, this isn't always possible

(4.9) a. Ej u-da-l-o-s' otkry-t' dver'.

she.DAT TEL-give-PAST-N-REFL open-INF door(ACC.SGF)

'She managed to open the door.'

b. ?Ej u-da-l-o-s' otkry-**yv**-at' dver'.

she.DAT TEL-give-PAST-N-REFL open-**IMPF**-INF door(ACC.SGF)

(intended: 'She managed to be opening the door.')

- ▶ the proper treatment of viewpoint aspect (cont.)
 - ▶ direct/event perception constructions take clausal complements in Russian
 - ▶ even if it is possible to some extent in English and Russian to express viewpoint aspect in the core
 - ▶ it's not obvious that this happens more than marginally
 - ▶ aside from direct perception in English
 - ▶ corpus evidence may be needed to evaluate the status of core-layer viewpoint marking further

- ▶ the proper treatment of viewpoint aspect (cont.)
 - ▶ Yucatec Maya likewise disallows the expression of viewpoint aspect contrasts in core junctures

In matrix clauses,
aspect is marked
in two positions:
by a verbal **prefix**
or auxiliary, and by
a verbal **suffix**.

(4.8)

T-inw=il-ah

PRV-A1SG=see-CMP(B3SG)

'I saw you fall(ing)'

In non-finite
cores, only
the **suffix**
appears

a=lúub-**ul**

A2=fall-INC

Selection of the suffix
category is fixed by
construction and
transitivity of the
complement
(cf. Bohnemeyer 2009)

- ▶ the proper treatment of viewpoint aspect (cont.)
 - ▶ more Yucatec examples

(4.9) Le=òok'ol=o' t-u=mèet-ah u=ch'a'-b-**al**
 DEF=steal=D2 PRV-A3=make-CMP(B3SG) [A3=take-PASS-**INC**
 le=ta'kin tuméen Pedro=o'
 DEF=money CAUSE Pedro]=D2
 'The thief, (s)he made Pedro take the money (lit. made the money
 be taken by Pedro)'

(4.10) Le=pàal=o', t-u=ts'a'-ah u=báah k'àay-∅.
 DEF=child=D2 PRV-A3=put-CMP(B3SG) A3=self [sing\ATP-**INC**]
 'The child, (s)he tried to sing'

- ▶ interim conclusions
 - ▶ the relation between topic time and event/situation time is a necessary part of the interpretation of the clause
 - ▶ even in languages that don't express viewpoint aspect, such as German and Finnish (Bohnenmeyer & Swift 2004)
 - ▶ although it may of course be left undetermined, e.g., in shallow processing
 - ▶ the ability to express viewpoint aspect in the core is language- and construction-specific
 - ▶ this kind of flexibility is perhaps not so surprising given the relational nature of viewpoint aspect
 - ▶ mediating b/w situation time (core) and topic time (clause/sentence/discourse)

- ▶ a final twist: finiteness
 - ▶ Klein (2006, 2009): finiteness should be considered an operator in its own right (in present terms, a restrictor)
 - ▶ in line with the INFL/"I" head of more traditional versions of GB/P&P/MP

"More importantly, many structural phenomena are clearly associated with the presence or absence of finiteness, a fact which is **clearly reflected in the early stages of first and second language acquisition**. In syntax, these include **basic word order rules, gapping, the licensing of a grammatical subject** and the **licensing of expletives**. In semantics, the **specific interpretation of indefinite noun phrases** is crucially linked to the presence of a finite element. These phenomena are surveyed, and it is **argued that finiteness (a) links the descriptive content of the sentence (the 'sentence basis') to its topic component (in particular, to its topic time), and (b) it confines the illocutionary force to that topic component.**" (Klein 2006: 245; emphasis *JB*)

- ▶ a final twist: finiteness (cont.)
 - ▶ my take
 - ▶ finiteness is a morphosyntactic distinction with variable semantic impact
 - ▶ it can be treated as an operator “shell”
 - ▶ into which different languages project true restrictors appropriate for the particular language
 - ▶ English: tense + subject agreement
 - ▶ Yucatec: viewpoint aspect, modality, temporal remoteness
 - ▶ Wogeo (Austronesian; PNG): mood? (Exter 2012) + subject agreement

▶ a final twist: finiteness (cont.)

▶ the Yucatec facts: recap

In matrix clauses,
aspect is marked
in two positions:
by a verbal **prefix**
or auxiliary, and by
a verbal **suffix**.

In non-finite
cores, only
the **suffix**
appears

(4.8) **T-inw=il-ah**
PRV-A1SG=see-CMP(B3SG)
'I saw you fall(ing)'

a=lúub-ul
A2=fall-INC

- ▶ the preverbal marker occurs only in matrix clauses and RCs
 - ▶ Bohnemeyer (2002, 2009) argues against the existence of embedded complement clauses in the language
- ▶ it expresses, in a single paradigm of 15 mutually exclusive markers, viewpoint aspect, modality, and temporal remoteness
- ▶ the language is tenseless (Bohnemeyer 2002, 2009)
- ▶ the presence/absence of the preverbal marker is the best candidate for an expression of finiteness in Yucatec

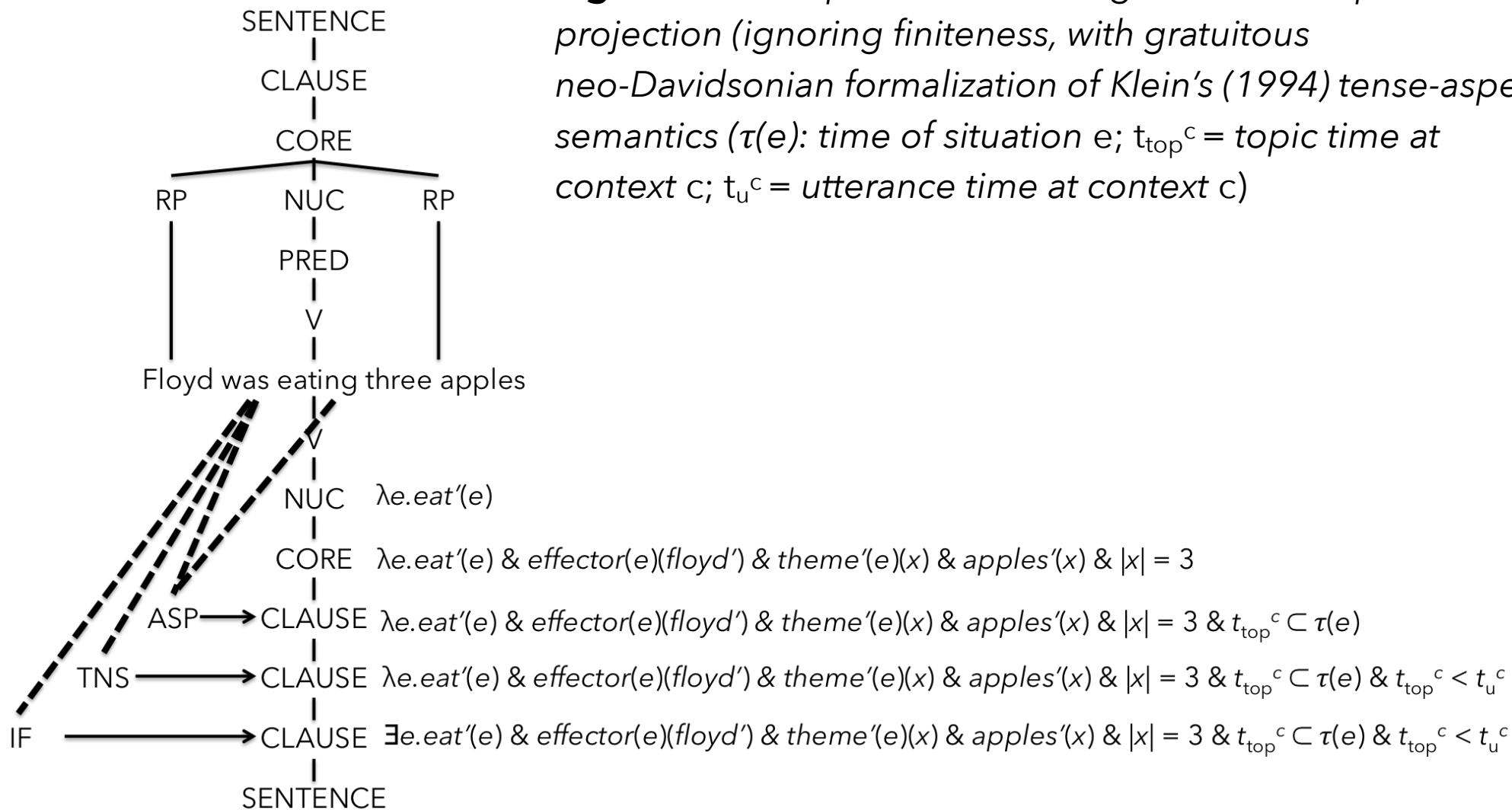
► the revised operator hierarchy

Table 4.4. *Operators in the layered structure of the clause - revised edition*

Layer	Restrictors	Functors/relators
Nucleus	Aktionsart	Negation
Core		Viewpoint aspect
	Clause Sentence	

► how it works

Figure 4.5. Sample tree illustrating the revised operator projection (ignoring finiteness, with gratuitous neo-Davidsonian formalization of Klein's (1994) tense-aspect semantics ($\tau(e)$: time of situation e ; t_{top}^c = topic time at context c ; t_u^c = utterance time at context c))



SYNOPSIS

- ▶ Operators: an evolutionary approach
- ▶ Operator projections: implications
- ▶ Unified theories of TAM
- ▶ The proper treatment of TAM in RRG
- ▶ Summary

SUMMARY

- ▶ operators can be classified into
 - ▶ placeholders, which represent a referent that's part of the speaker's intended message
 - ▶ by specifying a search domain that is not
 - ▶ functors and relators, which represent parts of the speaker's intended message
 - ▶ that have combinatorial properties distinct from those of lexical category members
- ▶ restrictors, which are inherently backgrounded
 - ▶ and serve to facilitate comprehension by reducing the hearer's inference load

- ▶ the typological distribution of restrictors shows much greater variation than the distribution of the other operator types
- ▶ restrictors also exhibit considerably greater evidence of grammaticalization from distinct sources
- ▶ both of these properties can be account for by their pragmatic and psycholinguistic properties
 - ▶ in combination with an evolutionary model

- ▶ viewpoint aspect, as distinct from aktionsart, is not a nuclear operator
 - ▶ it is most commonly expressed at the clause layer
 - ▶ core-layer expression of viewpoint contrasts is language- and construction-specific
- ▶ with this modification, RRG is compatible with state-of-the-art unified theories of tense-aspect semantics
- ▶ the RRG operator projection lends itself to compositional event-semantic analyses of the semantics of TAM operators

ACKNOWLEDGEMENTS

- ▶ boatloads of thanks to
 - ▶ Anastasia Stepanova
 - ▶ Robert Van Valin, Jr.
 - ▶ you guys!!!

THANKS!

