



Operator, information

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

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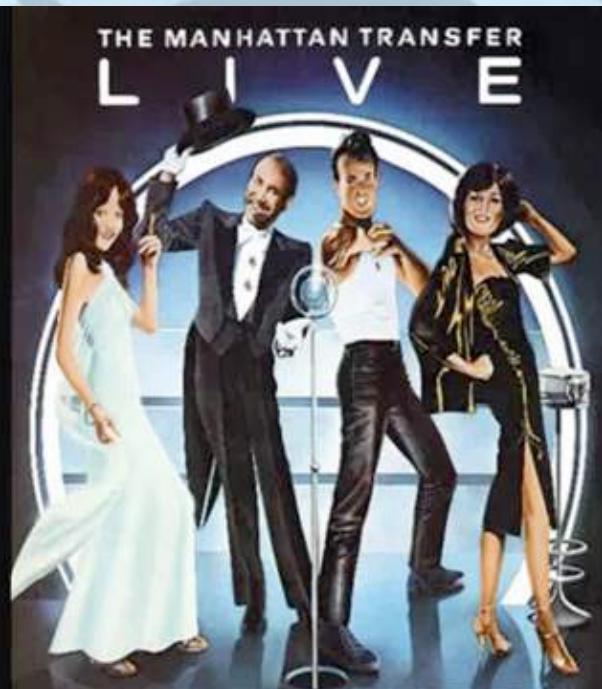
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University at Buffalo
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Operator, information

In case you wondered about the title...



University at Buffalo
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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)

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

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)

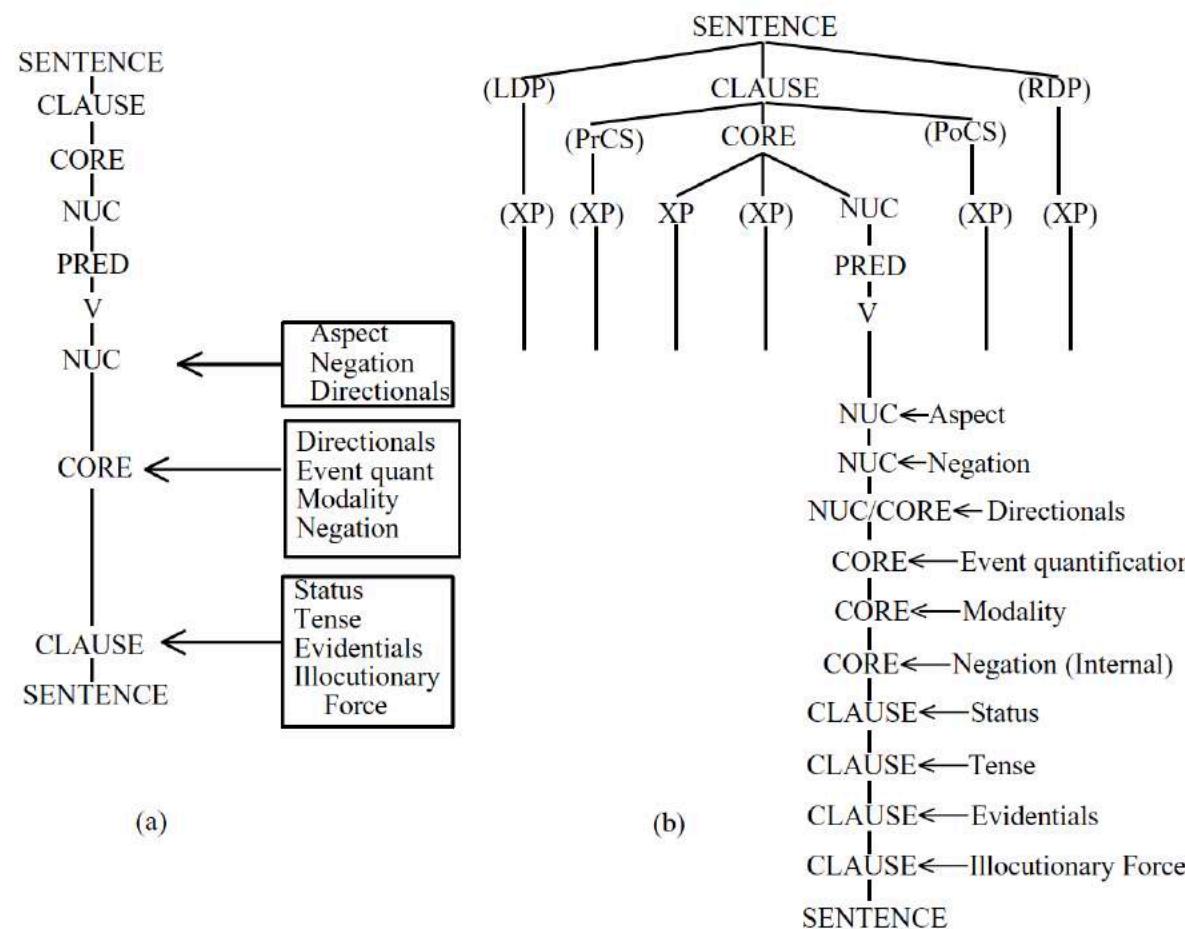


Figure 1.1. Layered structure of the clause with constituent and operator projections (Van Valin 2005: 12)

- ▶ 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

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

- ▶ previous classifications: Hockett 1956

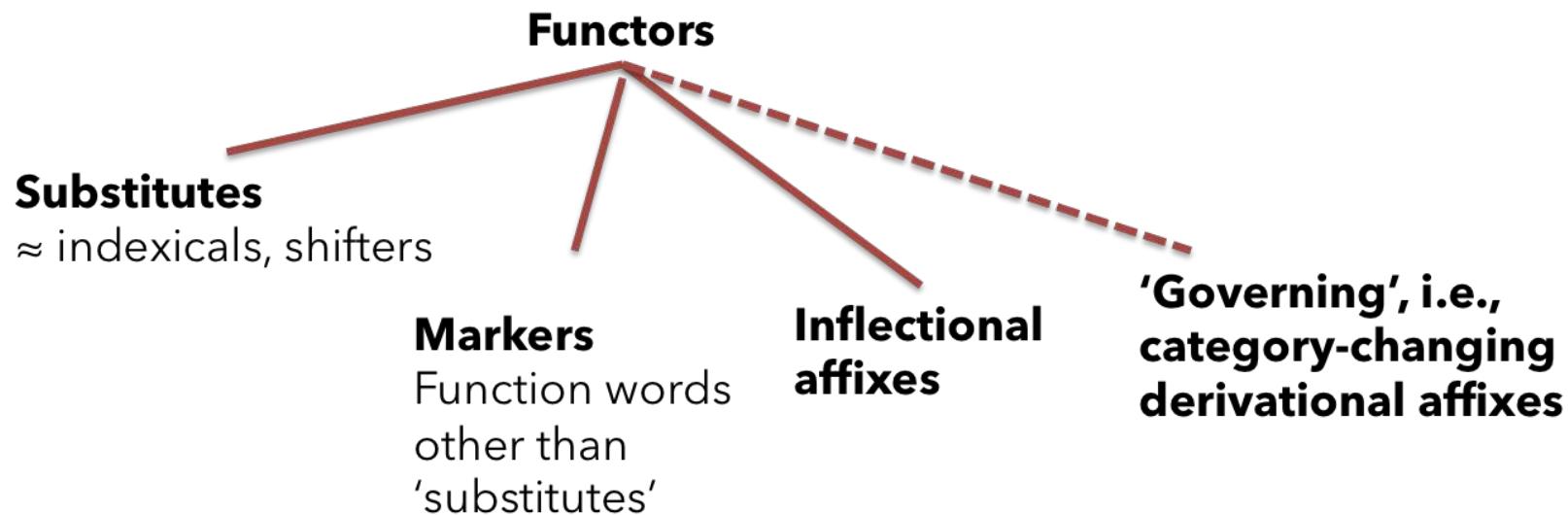


Figure 1.2. Hockett's (1956: 264-265)
taxonomy of operators (or 'functors')

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

▶ previous classifications: Hengeveld 1989

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

Operators (positions)

$$(E_1 : [\pi_4 \text{ILL} (S) (A) (\pi_3 X_1 : [\text{proposition}] (X_1))] (E_1))$$

$(\pi_2 e_1 : [\pi_1 \text{Pred}_\beta(x_1) (x_2) \dots (x_n)] (e_1))$

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

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

▶ previous classifications: mainstream Generative Grammar

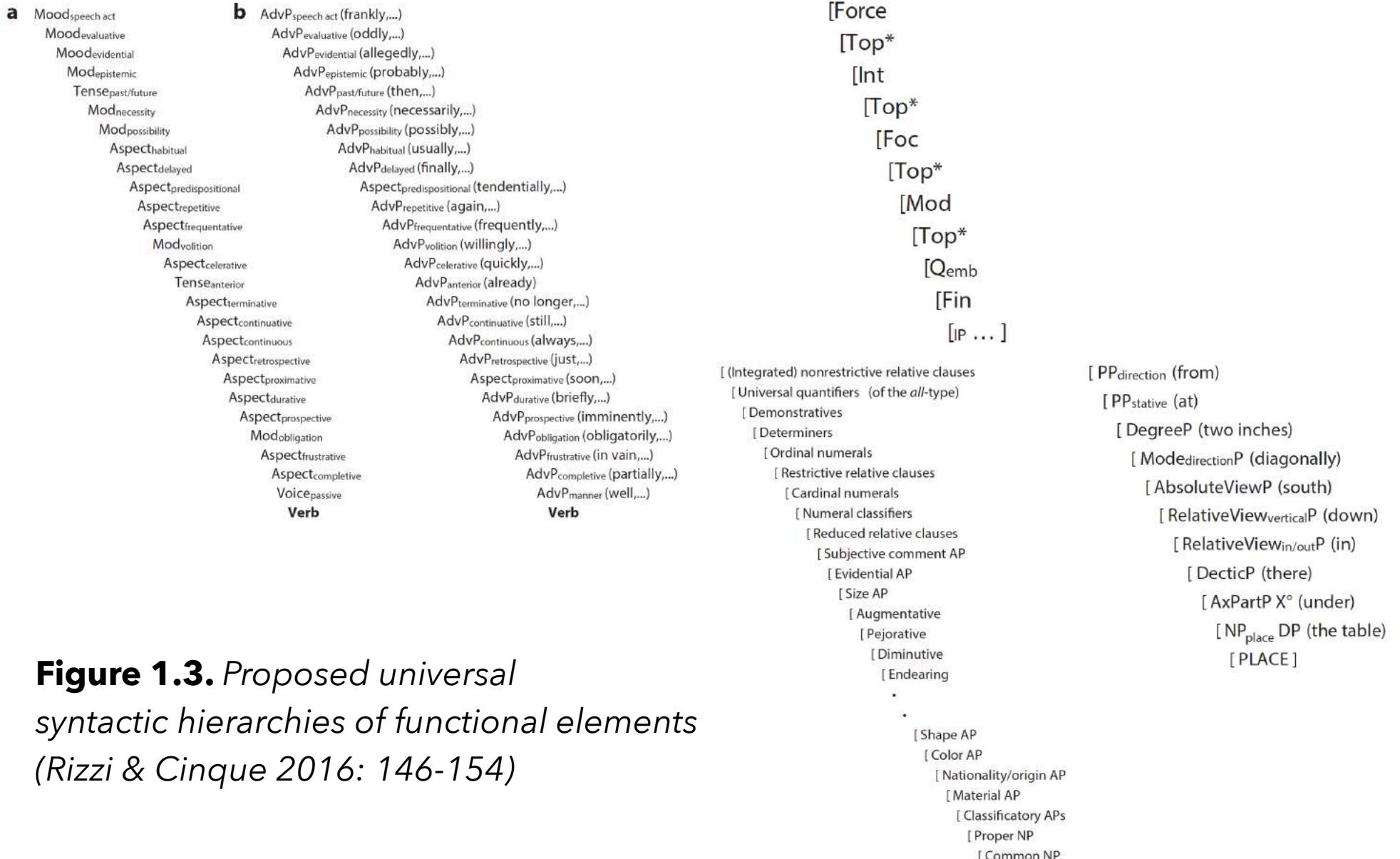


Figure 1.3. Proposed universal syntactic hierarchies of functional elements
(Rizzi & Cinque 2016: 146-154)

- ▶ 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

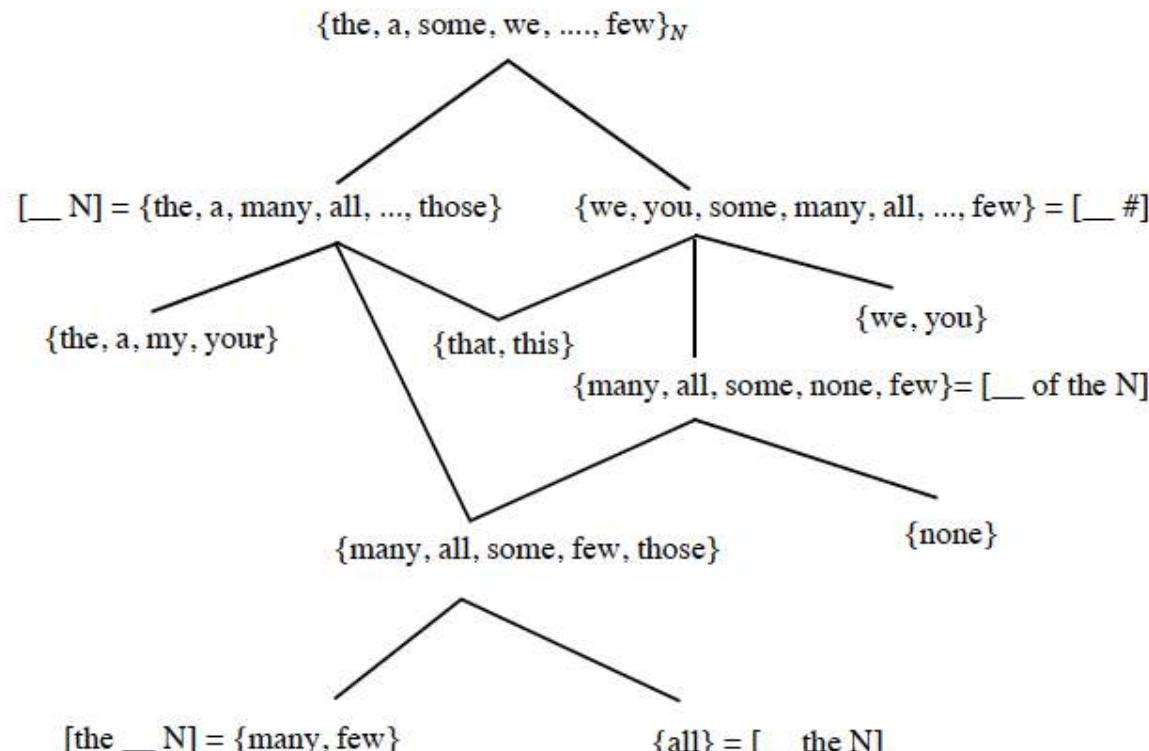


Figure 1.4. Lattice representing a taxonomy of nominal functional categories of English defined in terms of distributional classes (Cann 2000: 18)

▶ 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)

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

▶ toward a new classification

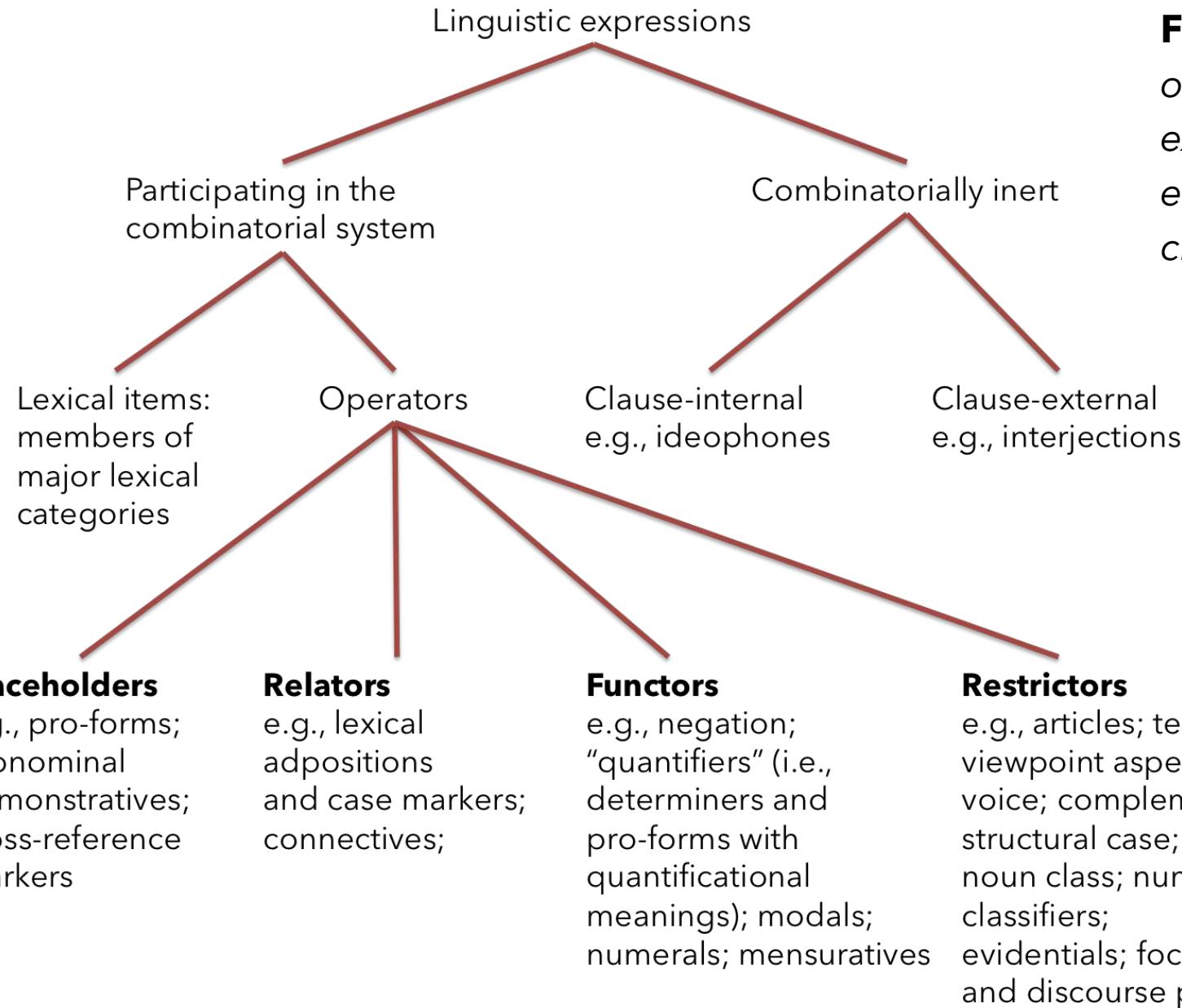


Figure 1.6. A taxonomy of natural language expressions, with special emphasis on the classification of operators

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

- ▶ 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	<<e,t>,<e,t>>
Non-relational common nouns, standard-form predicative adjectives, intransitive verbs, VPs	<e,t>	Lexical adpositions	<<<e,t>,>t>,<e,t>>
NPs headed by common nouns	<<e,t>,>t>	Determiners	<<e,t>,<<e,t>,>t>>
Relational common nouns, comparative-form predicative adjectives, transitive verbs	<e,<e,t>>	Modals, VP negation	<<e,t>,<<<e,t>,>t>,>t>>
Ditransitive verbs	<e,<e,<e,t>>>	Sentential negation	<t,t>
Attributive adjectives, relative clauses	<<e,t>,<e,t>>	Coordinative conjunctions	<t,<t,t>>
Clauses, sentences	t		

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

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

- ▶ 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.

$e_1 \qquad \qquad e_2 \qquad \qquad e_3$

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

$s_1 \qquad \qquad \qquad e_4 \qquad \qquad \qquad e_5$

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

$s_2 \qquad \qquad \qquad s_3$

(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

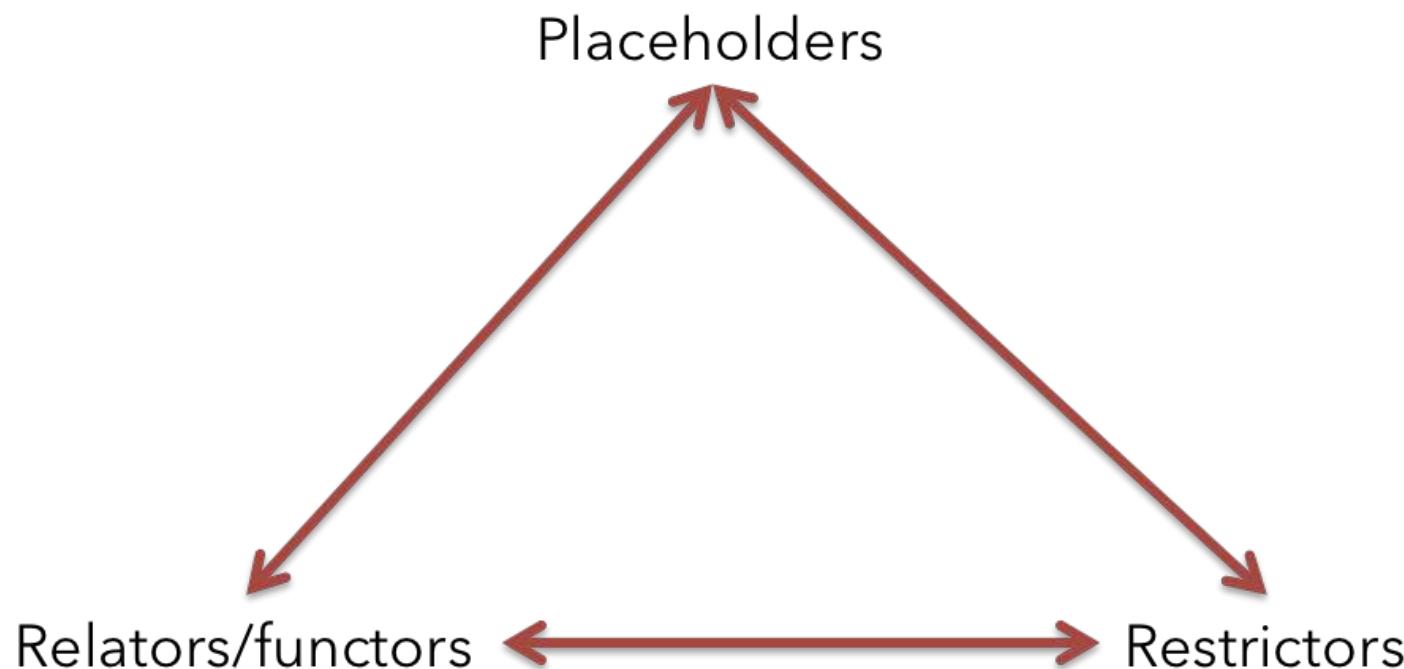


Figure 1.7. Graded transitions between operator types

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

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

- ▶ 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

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

- ▶ an evolutionary model
of the grammaticalization of restrictors

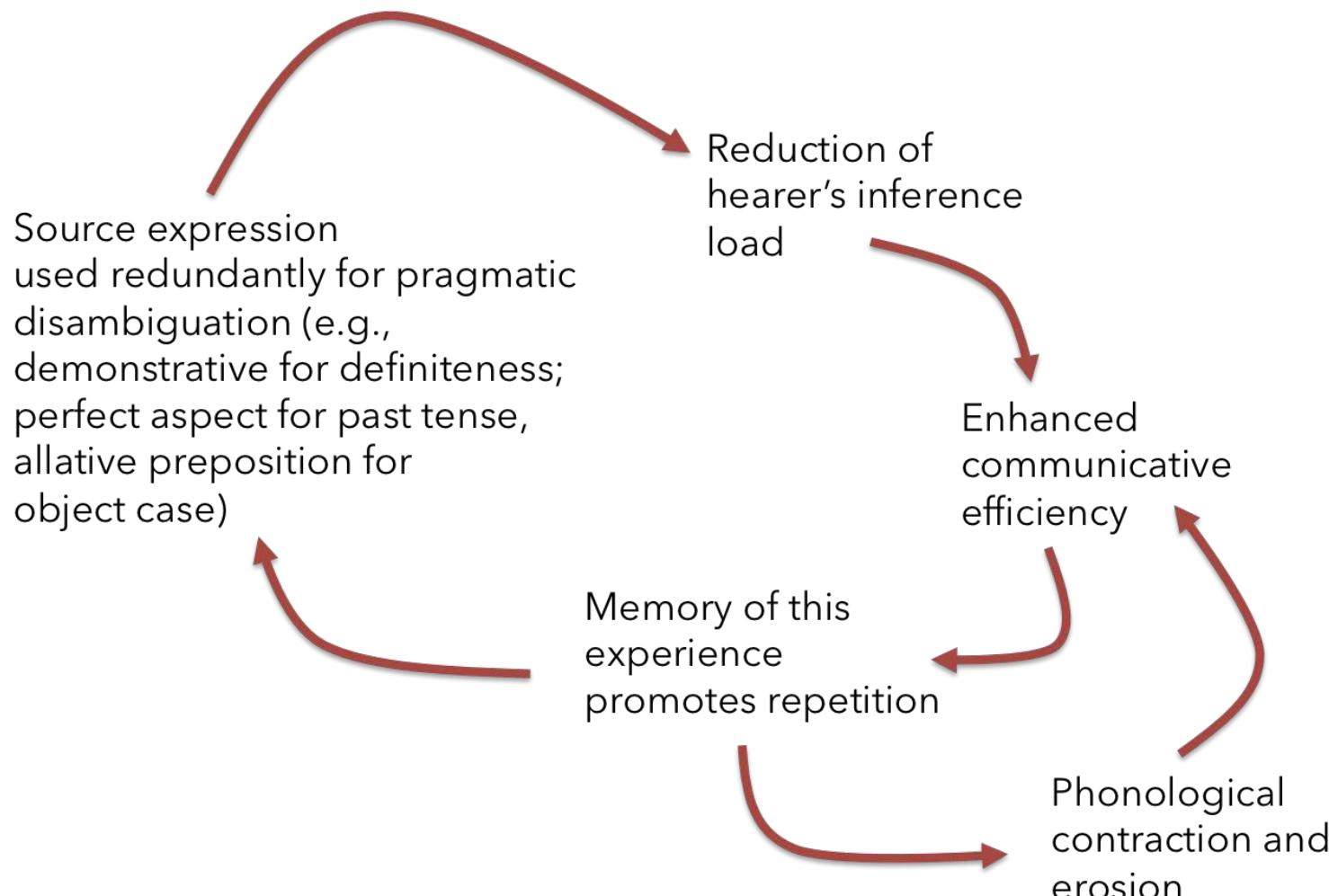


Figure 1.8. The grammaticalization of restrictors
as an evolutionary process

- ▶ 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

OPERATORS: AN EVOLUTIONARY APPROACH (CONT.)

- ▶ evidence for cross-linguistic variation: WALS

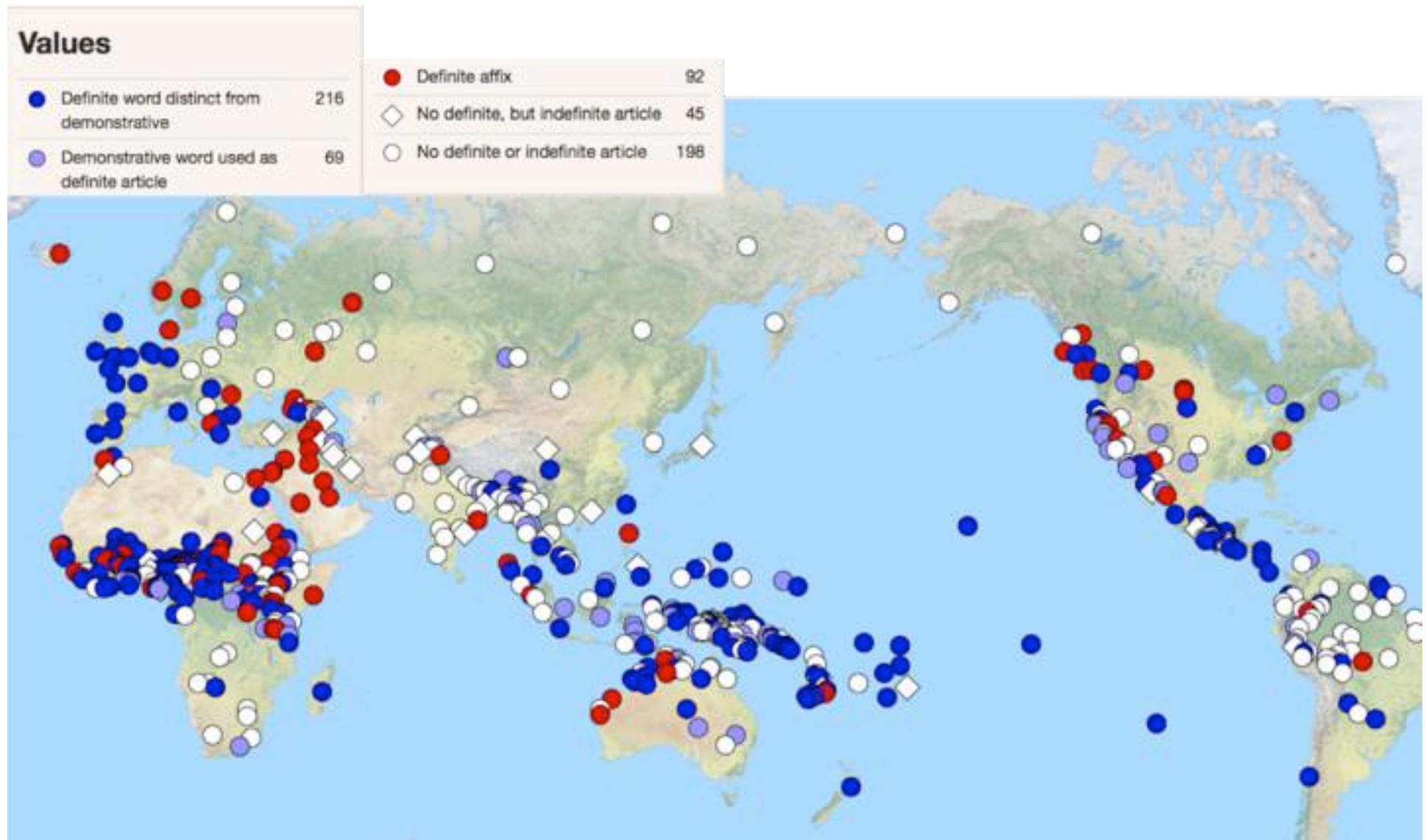


Figure 1.9. Distribution of definiteness markers in WALS (Dryer 2013)

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

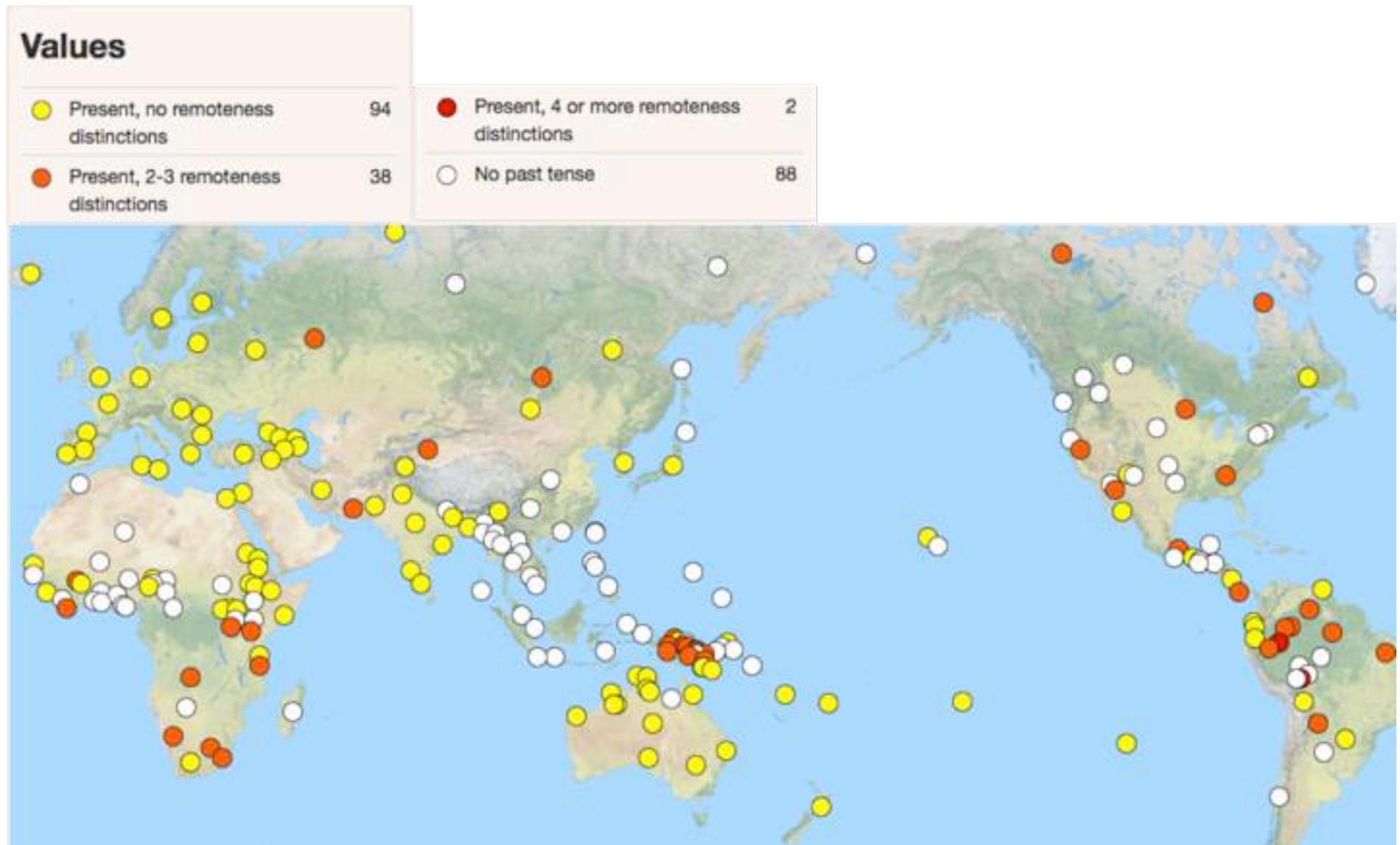


Figure 1.10. Distribution of past tense markers in WALS (Dahl & Velupillai 2013)

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

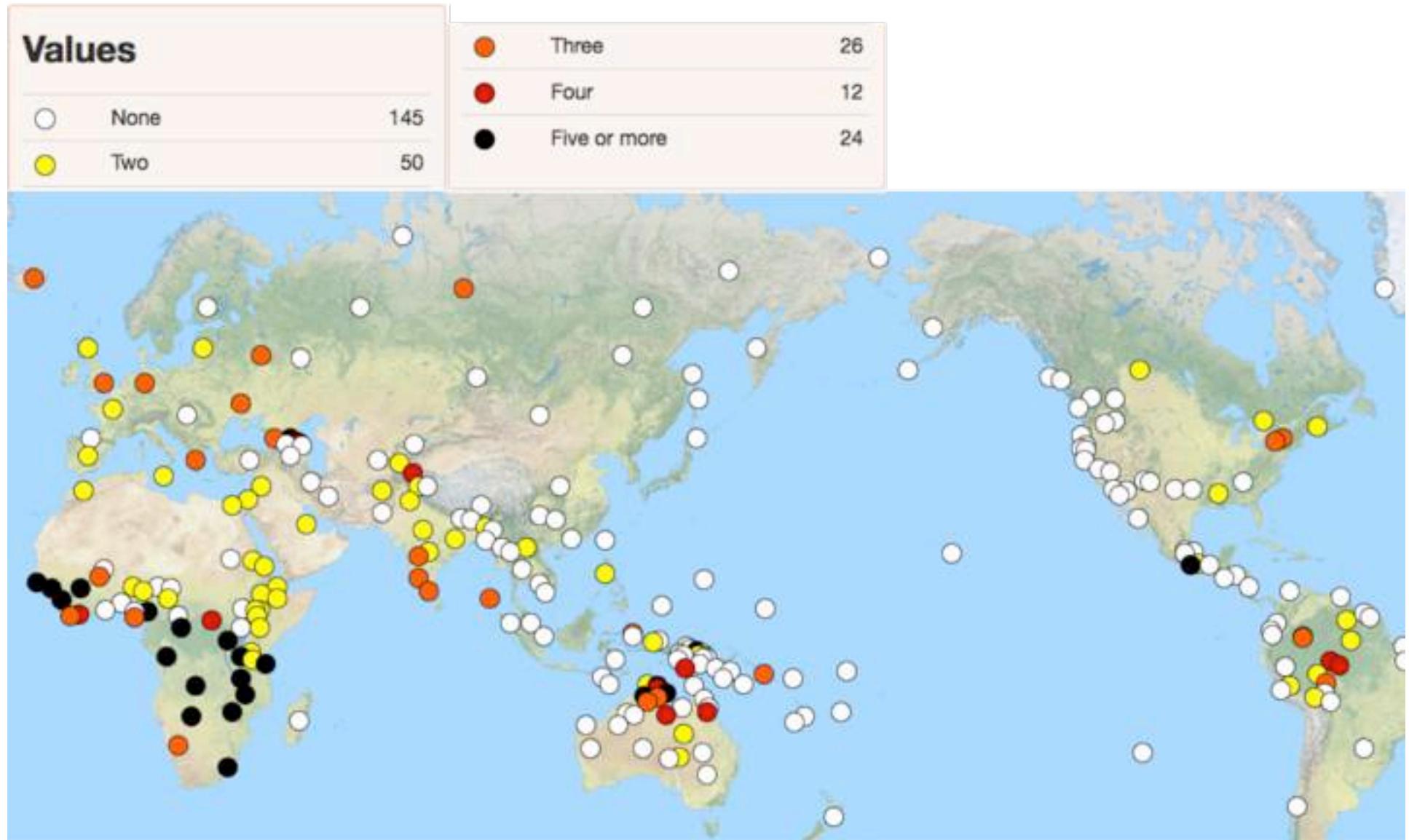


Figure 1.11. Distribution of gender/noun class markers in WALS (Corbett 2013)

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

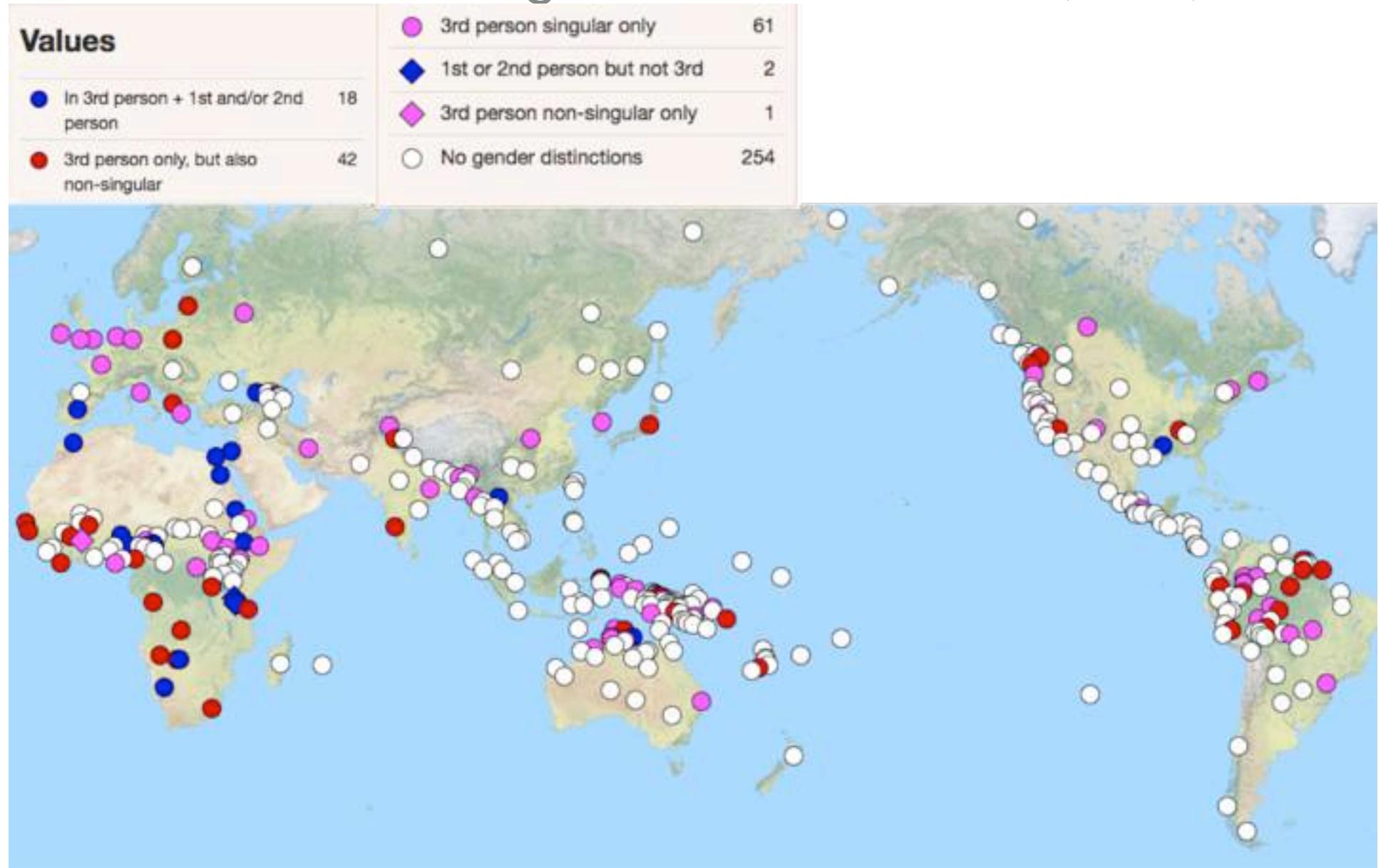


Figure 1.12. Gender marking in independent pronouns in WALS (Siewierska 2013)

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
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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**

UNIFIED THEORIES OF TAM (CONT.)

► 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 'aktsionsart' are commonly treated as synonymous - not so here!

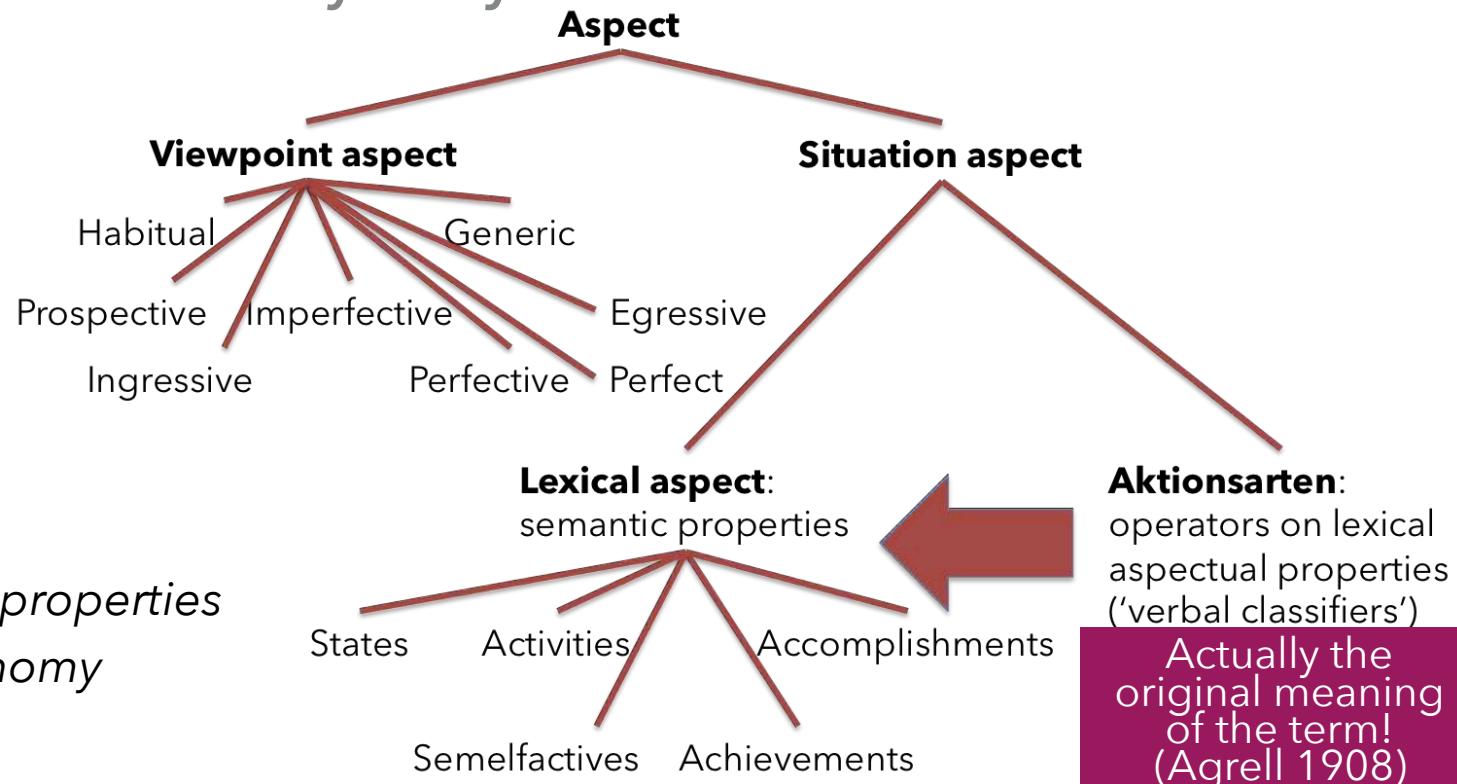


Figure 3.1. Aspectual properties and operators - a taxonomy

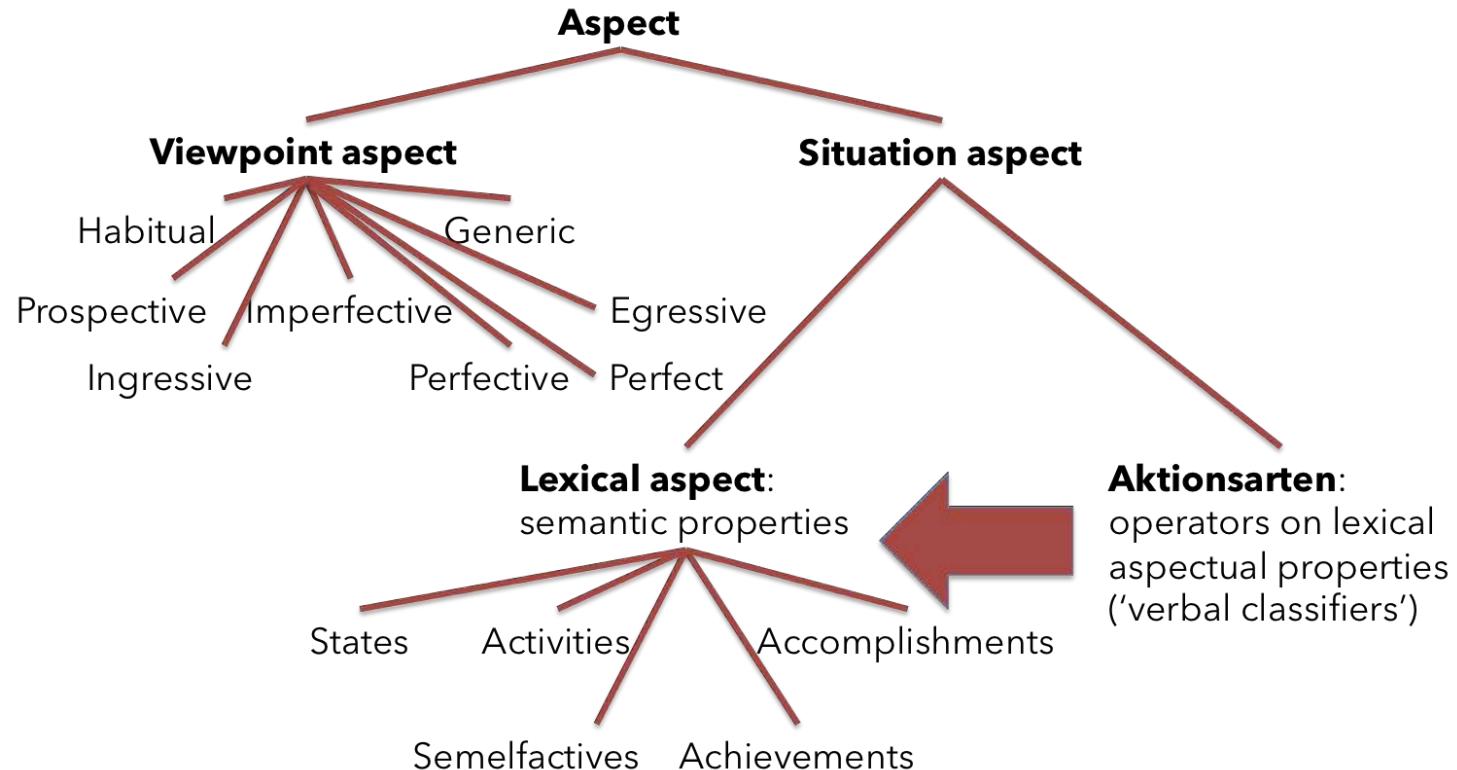
UNIFIED THEORIES OF TAM (CONT.)

► 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)

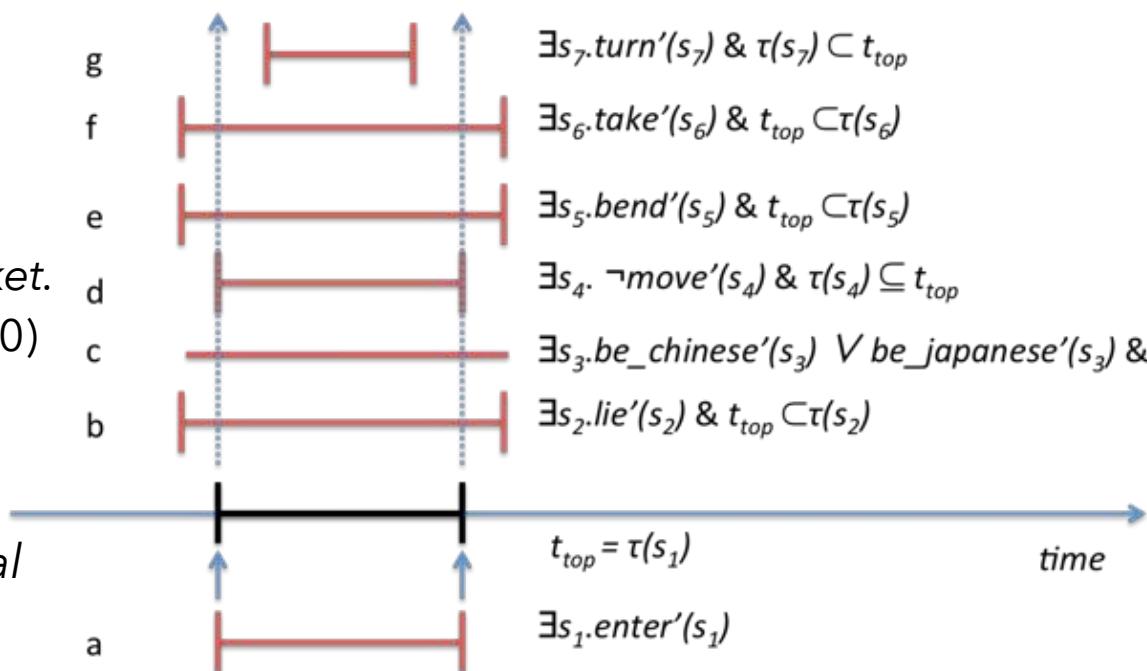


Figure 3.3. Diagramming the temporal structure of (3.1)

- ▶ 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