AN EVOLUTIONARY APPROACH TO THE TYPOLOGY OF FUNCTIONAL EXPRESSIONS

THE LINGUISTIC CIRCLE OF COPENHAGEN
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OUTLINE

▸ A typological puzzle

▸ A theory of functional expressions

▸ Some data

▸ An evolutionary model of grammaticalization

▸ Supporting evidence: the ecology of definiteness marking

▸ Summary

A TYPOLOGICAL PUZZLE

▸ taking a page from Sapir (1921: 86-126)

▸ though no fowl shall be harmed in the present version

▸ all of the following utterances
are responses to Scene 20 of Wilkins (2016)

20.
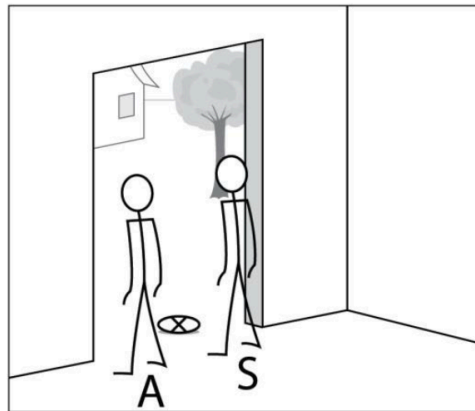
Spkr and Addr are inside a house looking out of (open) door. They are near the doorway. The referent is just outside of door (near it). The referent is easily reached by both Addr and speaker (and equidistant from both). "I like _____ book/radio." "Who's book/radio is ___?"
• Does it make a difference if the Spkr points or not? Must Spkr point?
• Does it make a difference if object has been mentioned before?
• Does it make a difference if Addr already has attention on object vs. attention being drawn?
• Does term change with change in closeness of Spkr/Addr to door? Closeness of object to door?

Figure 1.1. *Scene 20 of Wilkins (2016)*

(1.1) Hijazi Arabic (Saudi Arabia)

Li-man **ði:h** **el-**kita:b?

to-who this(SG) DEF-book

'Whose is this book?' (Ali M. Alshehri, p.c.)

(1.2) German

We-m gehör-**t** **dies-es** Buch?

who-DAT.SG belong-3SG.PRS this-SG.N.NOM book

'To whom does this book belong?'

(1.3) Japanese (colloquial)

Kono hon **dare=no**?

this book who=GEN

'Whose book is this?' (Mitsuaki Shimojo, p.c.)

(1.4) Japanese (formal)

Kono hon(**=wa**) **dare=no** **desu** **ka**?

this book=TOP who=GEN COP Q

'Whose is this book?' (Mitsuaki Shimojo, p.c.)

(1.5) Saliba-Logea (Oceanic, Papuan Tip)

Kaiteya **yo-na** tobwa **ina**?

who CL1-3SG.POSS bag this

'Whose bag is this?' (Margetts 2016: 261)

(1.6) Yucatec Maya (Mexico)

Máax ti'a'l **le=lìibro** **he'l=o'**?

who property(B3SG) DEF=book PRSV=D2

'Whose property is that book over there?'

Table 1.1. *Summary of functional meanings expressed in (1.1)-(1.6)*

Expressed in all examples	Expressed only in particular languages
• Interrogative pro-form • Demonstrative (or complex expression of spatial deixis) • (Complex expression of) possession • Interrogative speech act (mostly coded via sentence type construction)	• Definiteness (Arabic, Yucatec) • Case (German, Japanese) • Gender/noun class (German, Saliba) • Number (Arabic, German, Saliba, Yucatec) • Person (German, Saliba, Yucatec) • Topic (Japanese)

▸ what accounts for this differential distribution?

▸ my answer in a nutshell

  ▸ the functional meanings that are expressed in all languages are part of the speaker's intended message

  ▸ the typologically variable functional expressions serve to facilitate comprehension

Table 1.2. *Communicative functions of constituents of (1.1)-(1.6)*

Speaker's intended message	Redundant facilitative categorizations
• Draw ADDR's attention to x	• Topic time includes utterance time
• Lexically categorize x	• Uniqueness of x in speech situation
• Relate x to possessor y	• x is inanimate; $|x| = 1$
• Ask about identity of y	• Possessed: x; possessor: y
	• Topic: x; focus: y

▸ but what mechanism causes non-redundant functional expressions to be distributed near-universally

   ▸ and redundant ones to be distributed much more variably?

▸ to account for this, we need an upgrade to **grammaticalization theory** (**GT**)

   ▸ a mechanism for **functional selection**

      ▸ that boosts the grammaticalization of expressions adapted for **communicative fitness**

GT	+	FUNCTIONAL SELECTION MECHANISM	=	EVOLUTIONARY MODEL OF LANGUAGE CHANGE THAT ACCOUNTS FOR TYPOLOGICAL DISTRIBUTIONS

Figure 1.2. *Grammaticalization and functional selection*

▸ the bigger picture: typology and evolutionary linguistics

  ▸ cf. Greenberg (1978, 1992)
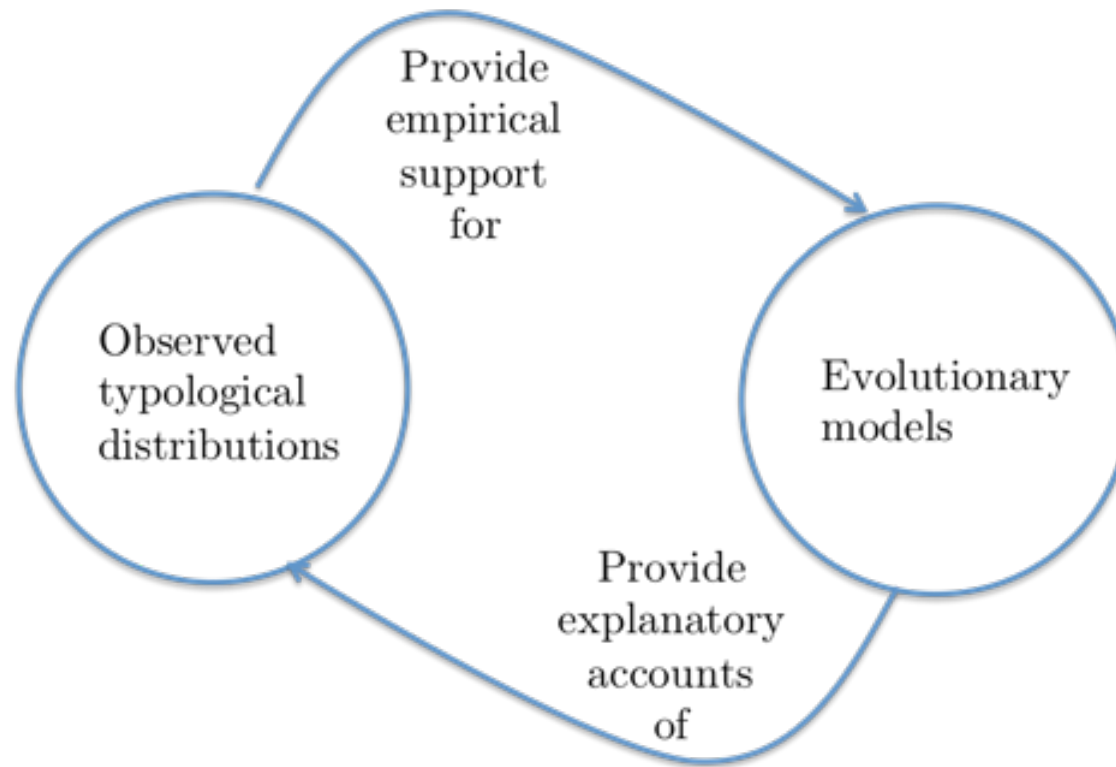
Figure 1.3. *The interaction between typology and evolutionary linguistics*

▸ **the organization of this talk
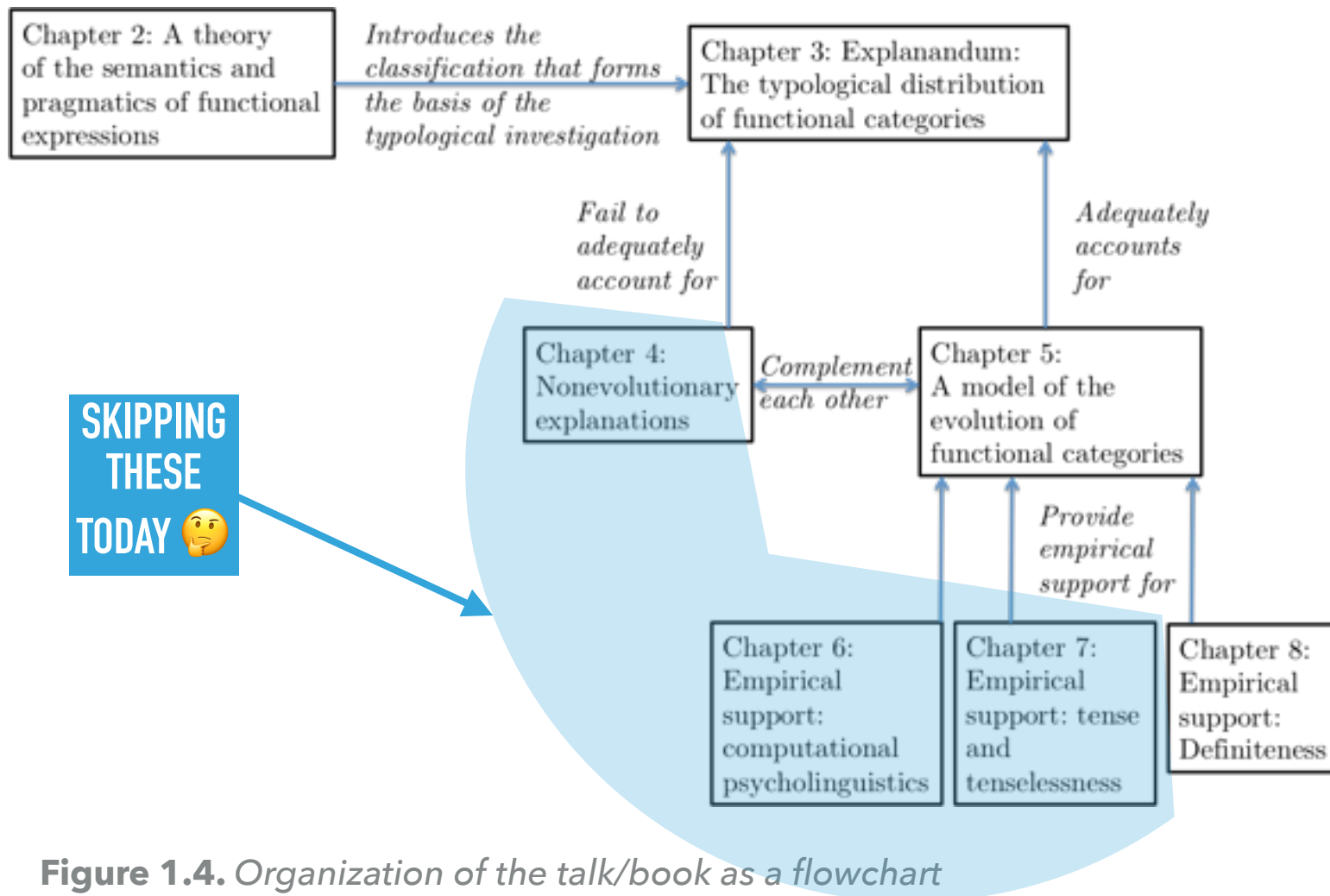(and the organization of the book I'm working on)**

Figure 1.4. *Organization of the talk/book as a flowchart*

▸ commitments

- ▸ **evolutionary functionalism** - only evolutionary models can explain how semantic/pragmatic functions shape language

  - ▸ as long as teleological explanations are rejected

  - ▸ cf. Keller (1994); Hawkins (1994, 2004, 2014); Croft (1995, 2000); Haspelmath (1999a,b), *inter alia*

- ▸ **constructionism** - constructions are simple or templatic signs with conventionalized iconic and symbolic meanings

  - ▸ with morphophonological, morphosyntactic, semantic, and pragmatic properties that continuously evolve

  - ▸ cf. Langacker (1987); Goldberg (1995); Croft (2001); Boas & Sag (2012); *inter alia*

▸ commitments (cont.)

  ▸ **probabilistic pragmatics** - comprehension is based on (often non-monotonic) inferences, not on decoding

    ▸ cf. Grice (1975, 1989); Sperber & Wilson (1987); Clark (1996); Levinson (2000); Goodman & Frank (2016); *inter alia*

  ▸ **categorical particularism** - constructions and types of functional expressions are strictly language-specific = *emic*

    ▸ the *etic* 'comparative concepts' we use to compare them have no explanatory value

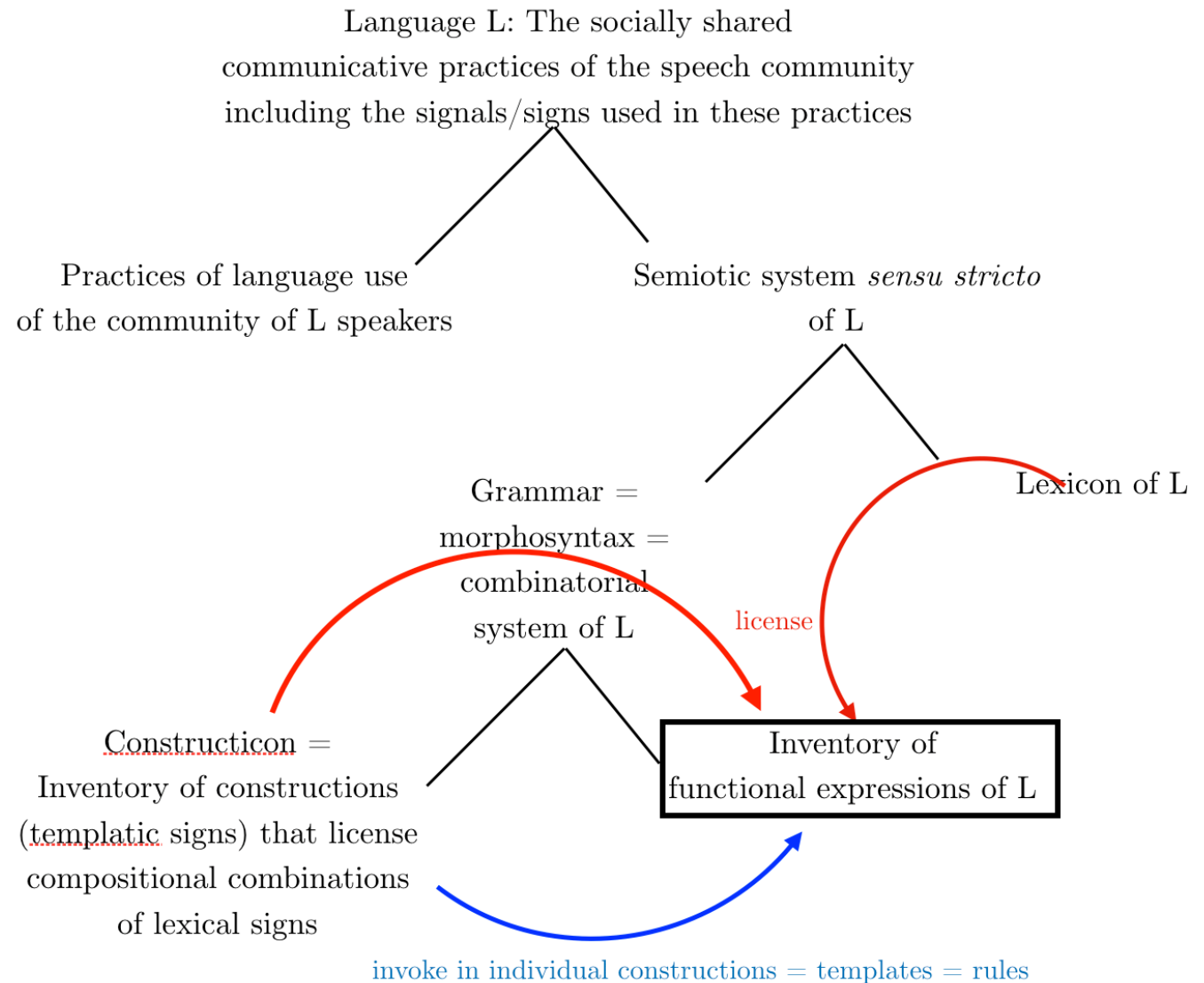   ▸ cf. Dryer (1997); Haspelmath (2007, 2010); *inter alia*

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A THEORY OF FUNCTIONAL EXPRESSIONS

▸ the role of functional expressions in language

Language L: The socially shared
communicative practices of the speech community
including the signals/signs used in these practices

Practices of language use
of the community of L speakers

Semiotic system *sensu stricto*
of L

Grammar =
morphosyntax =
combinatorial
system of L

license

Lexicon of L

Constructicon =
Inventory of constructions
(templatic signs) that license
compositional combinations
of lexical signs

Inventory of
functional expressions of L

invoke in individual constructions = templates = rules

Figure 2.1. *The place of functional expressions in the grammar of language L*

▸ so what are functional expressions? *In first approximation:*

  ▸ functional expressions are part of the grammar of the language *as individual expressions* (but types, not tokens)

    ▸ rather than as members of larger categories

  ▸ that is, there are construction templates/rules that reference the individual functional expressions

    ▸ e.g., in English

      ▸ the preposition *of* in possessive constructions

      ▸ the verb *be* in nonverbal predication and progressive aspect constructions

▸ so what are functional expressions? (cont.)

  ▸ this is not a new insight

"Roughly, then, the total stock of elementary forms of a language can be split into two unequal portions: *tea*, *write*, and all other grammatically 'unimportant' forms go into one portion (by far the larger), while *he*, *she*, and all other grammatically 'important' forms go into the other. The deletion of anyone or two forms from the first portion would leave the grammatical system of the language essentially unchanged; the deletion of even a single item of the second kind would have drastic consequences. Equally drastic consequences could not be achieved by tinkering with the first portion unless we deleted all the members of some large form-class" (Hockett 1958: 261-262).

▸ on this view, most, but not all, functional expressions are

  ▸ closed-class items

  ▸ grammaticalized

    ▸ e.g., *gehören* in (2.1) is an ordinary verb and *ti'a'l* in (2.2) an ordinary noun

(2.1) German

    We-m   gehör-**t**   **dies-es**   Buch?
    who-DAT.SG   belong-3SG.PRS this-SG.N.NOM book
    'To whom does this book belong?'

(2.2) Yucatec Maya (Mexico)

    Máax   ti'a'l   **le=**lìibro   **he'l=o'**?
    who   property(B3SG) DEF=book   PRSV=D2
    'Whose property is that book over there?'

▸ variables that form the basis
of the classification of functional expressions

    ▸ communicative function:
discourse-prominent vs. inherently backgrounded

    ▸ combinatorial and semiotic properties

▸ communicative function/discourse prominence

    ▸ inspired by Boye & Harder (2012)

    ▸ classifies functional expressions into those that may express **at-issue content** and those that may not

        ▸ the latter are said to be **inherently backgrounded**

▸ communicative function/discourse prominence (cont.)

  ▸ **at-issue content**: provides a (partial) answer
    to the context's **question under discussion** (QuD)

    ▸ by reducing the number of live alternatives
      that are consistent with the discourse

      ▸ Carlson (1982), Klein & von Stutterheim (1987, 2002), van Kuppevelt (1995, 1996), Roberts (1996, 2012), Büring (1997, 2003)

▸ communicative function/discourse prominence (cont.)

  ▸ the QuD of an utterance's context
    determines the utterance's information perspective

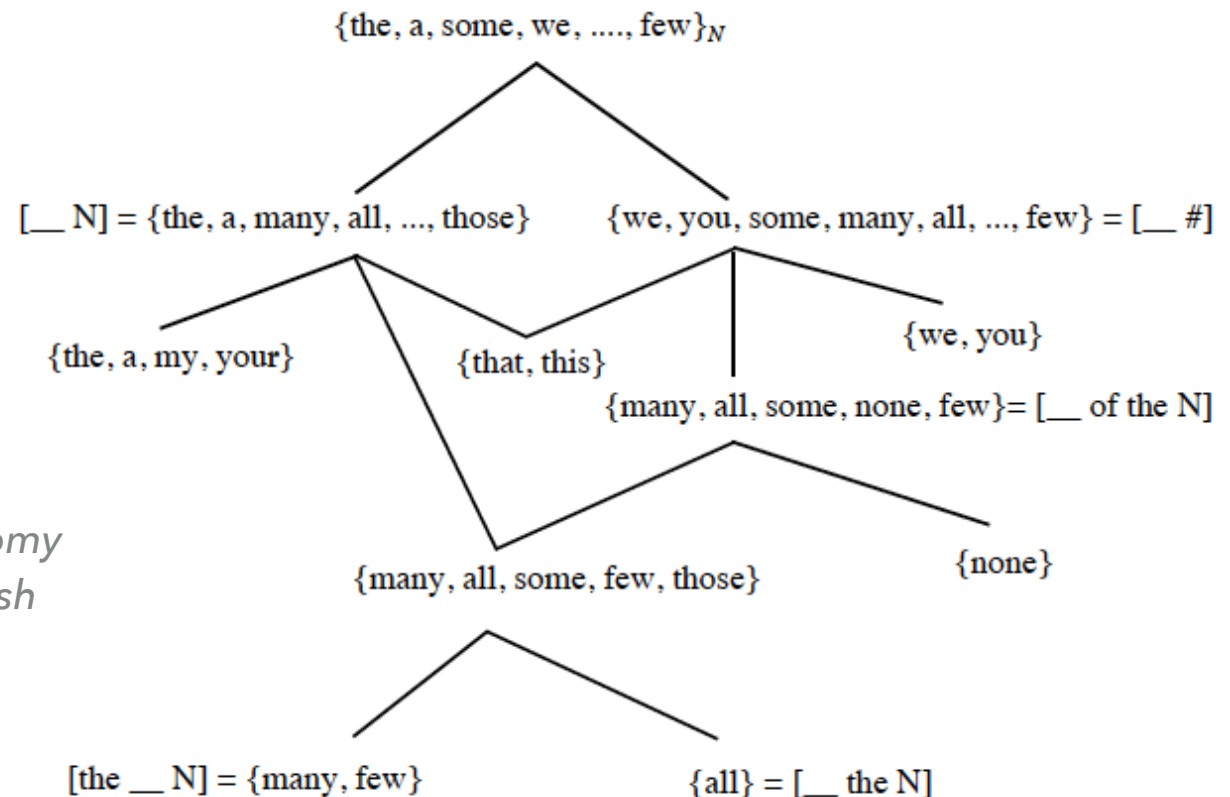   ▸ provided the utterance is felicitous
      and the discourse coherent

(2.3) a. [Q: Who ate the cake? — A:] FLOYD (did/ate the cake).

b. [Q: What did Floyd eat? — A:] (He ate) the CAKE.

c. [Q: What did Floyd do to the cake? — A:] EAT it / He ATE it.

d. [Q: What happened next? — A:] FLOYD ATE THE CAKE.

‣ communicative function/discourse prominence (cont.)

   ‣ inherent backgrounding of functional expressions means they cannot express at-issue content

      ‣ and thus cannot be focalized

      ‣ e.g., the past tense marker in (2.4) cannot be focalized

         ‣ stress on the auxiliary expresses 'verum focus'

      ‣ but the negation can

(2.4) Q: DID Floyd eat the cake? – A: NO.

▸ communicative function/discourse prominence (cont.)

  ▸ Boye & Harder (2012) treat discourse-primary expressions as not grammaticalized and not part of the grammar

  ▸ in contrast, the present approach allows for discourse-prominent functional expressions

    ▸ by treating discourse prominence as one of *two* (give or take) properties

      ▸ that govern the classification of functional expressions

▸ **combinatorial and semiotic properties**

   ▸ Cann (2000): functional categories can be defined in terms of language-specific distributional classes

      ▸ vis-à-vis the major lexical categories V, N, A

$\{\text{the, a, some, we, ..., few}\}_N$

$[\_\_ N] = \{\text{the, a, many, all, ..., those}\}$ $\{\text{we, you, some, many, all, ..., few}\} = [\_\_ \#]$

$\{\text{the, a, my, your}\}$ $\{\text{that, this}\}$ $\{\text{we, you}\}$

$\{\text{many, all, some, none, few}\} = [\_\_ \text{ of the N}]$

$\{\text{many, all, some, few, those}\}$ $\{\text{none}\}$

$[\text{the} \_\_ N] = \{\text{many, few}\}$ $\{\text{all}\} = [\_\_ \text{ the N}]$

Figure 2.2. *Lattice representing a taxonomy of nominal functional categories of English defined in terms of distributional classes (Cann 2000: 18)*

▸ combinatorial and semiotic properties (cont.)

▸ one way to visualize the semantic effect of combinatorial properties: **semantic type**

Lexical and phrasal categories		Functional expressions	
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 2.1. *Standard-issue extensional Montegovian type system for English sans events/situations*

▸ combinatorial and semiotic properties (cont.)

▸ the point: functional expressions differ from lexical expressions in that they are **syncategoremata** and more abstract and relational in their meanings

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▸ **combinatorial and semiotic properties (cont.)**

    ▸ consider also Sapir's (1921: 68-128) classification of linguistic meanings

Table 2.2. *Sapir's (1921: 92-93) classification of concepts expressed in* The farmer killed the duckling

I. CONCRETE CONCEPTS:
  1. First subject of discourse: *farmer*
  2. Second subject of discourse: *duckling*
  3. Activity: *kill*
    ——analyzable into:
  4. RADICAL CONCEPTS:
      1. Verb: *(to) farm*
      2. Noun: *duck*
      3. Verb: *kill*
  5. DERIVATIONAL CONCEPTS:
      1. Agentive: expressed by suffix *-er*
      2. Diminutive: expressed by suffix *-ling*
II. RELATIONAL CONCEPTS:
  Reference:
  1. Definiteness of reference to first subject of discourse: expressed by first *the*, which has preposed position
  2. Definiteness of reference to second subject of discourse: expressed by second *the*, which has preposed position
    Modality:
  3. Declarative: expressed by sequence of "subject" plus verb; and implied by suffixed *-s*
    Personal relations:
  4. Subjectivity of *farmer*: expressed by position of *farmer* before kills; and by suffixed *-s*
  5. Objectivity of *duckling*: expressed by position of *duckling* after *kills*
    Number:
  6. Singularity of first subject of discourse: expressed by lack of plural suffix in *farmer*; and by suffix *-s* in following verb
  7. Singularity of second subject of discourse: expressed by lack of plural suffix in *duckling*
    Time:
  8. Present: expressed by lack of preterit suffix in verb; and by suffixed *-s*

▸ combinatorial and semiotic properties (cont.)

  ▸ beyond semantic type, combinatorial properties in a broad sense also extend to

    ▸ indexicality

    ▸ the component of the meaning of the utterance that the functional expression operates on

Table 2.3. *Hengeveld's (1989: 131-132) classification of operators in Functional Grammar*

Table 2.4. *Operators in the layered structure of the clause (Van Valin 2005: 9)*

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

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

▸ how communicative and combinatorial properties
  come together

  ▸ some discourse-prominent expressions are lexical,
    others are part of the grammar

    ▸ due to their semiotic and combinatorial properties

  ▸ what unites them is that they are needed to express
    the speaker's intended message

  ▸ in contrast, inherently backgrounded functional expressions are
    redundant wrt. the intended message

    ▸ but instead serve to boost the odds
      that the hearer will infer the intended message

▸ how communicative and combinatorial properties come together (cont.)

    ▸ this distinction between communicatively primary and secondary functional expressions is not a new idea

        ▸ and neither is the observation that the latter are typologically more variable than the former

"We are thus once more reminded of the distinction between essential or unavoidable relational concepts and the dispensable type. The former are universally expressed, the latter are but sparsely developed in some languages, elaborated with a bewildering exuberance in others." (Sapir 1921: 99).
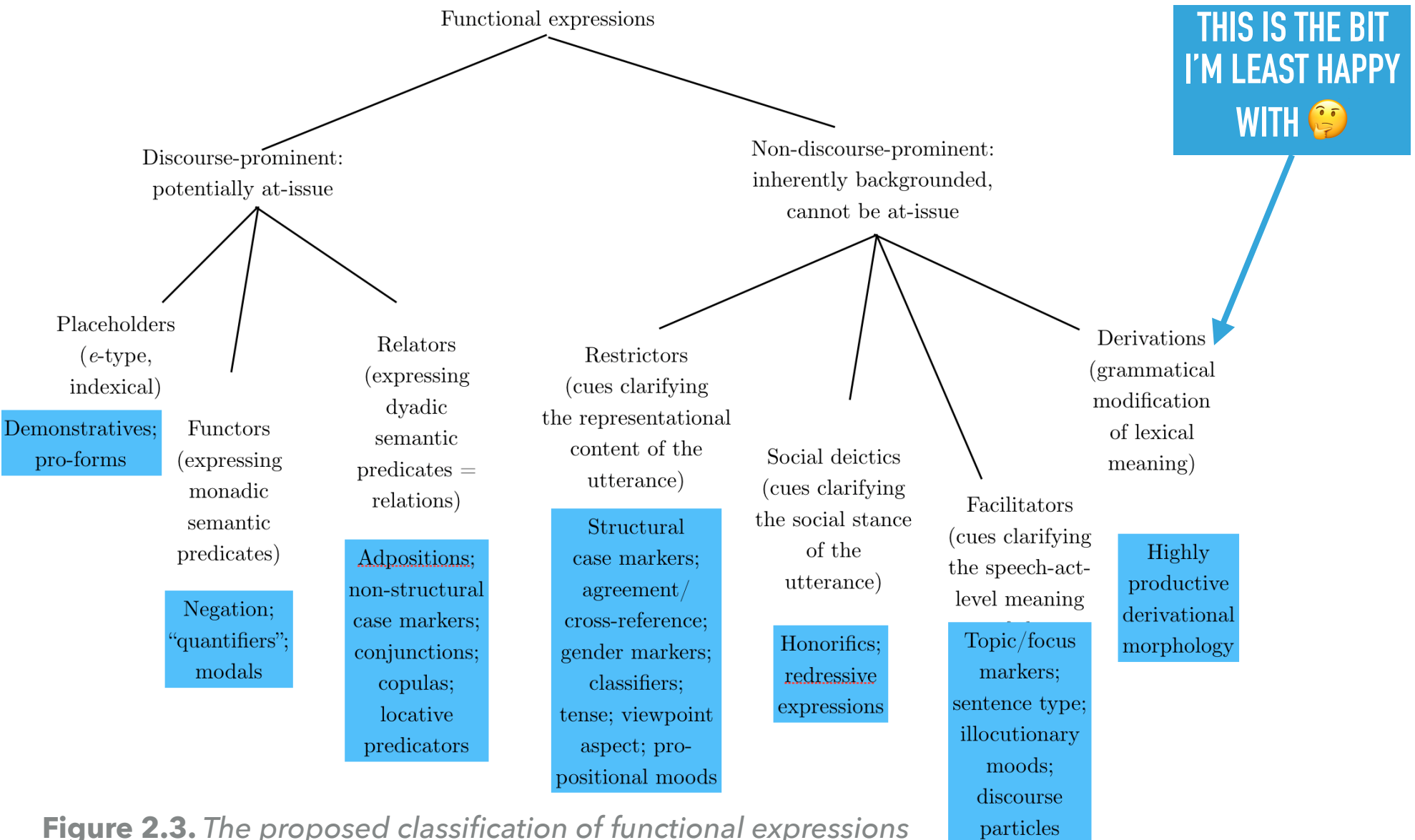
▸ the classification: let's have it!

Functional expressions

Discourse-prominent:
potentially at-issue

Non-discourse-prominent:
inherently backgrounded,
cannot be at-issue

THIS IS THE BIT
I'M LEAST HAPPY
WITH 🤔

Placeholders
(*e*-type,
indexical)

Demonstratives;
pro-forms

Functors
(expressing
monadic
semantic
predicates)

Negation;
"quantifiers";
modals

Relators
(expressing
dyadic
semantic
predicates =
relations)

Adpositions;
non-structural
case markers;
conjunctions;
copulas;
locative
predicators

Restrictors
(cues clarifying
the representational
content of the
utterance)

Structural
case markers;
agreement/
cross-reference;
gender markers;
classifiers;
tense; viewpoint
aspect; pro-
positional moods

Social deictics
(cues clarifying
the social stance
of the
utterance)

Honorifics;
redressive
expressions

Facilitators
(cues clarifying
the speech-act-
level meaning

Topic/focus
markers;
sentence type;
illocutionary
moods;
discourse
particles

Derivations
(grammatical
modification
of lexical
meaning)

Highly
productive
derivational
morphology

Figure 2.3. *The proposed classification of functional expressions*

▸ the classification: hybrids

   ▸ there quite a few pervasive expressions in natural languages that instantiate multiple types at ones

   ▸ e.g., morphologically unbound personal pronouns are placeholders (discourse-prominent)

      ▸ but the co-expressed categories of person, number, gender are restrictors on them (inherently backgrounded)

      ▸ similarly for the distance distinctions in demonstratives

▸ the classification: limits

  ▸ the proposed theory contains no principles from which to derive an exhaustive classification of functional expressions

    ▸ beyond the level of the seven super-types

  ▸ I'm skeptical that an exhaustive classification is possible

▸ the classification: limits (cont.)

  ▸ it's part of the "logic" of evolution

    ▸ that the possibility space for the emergence of new
      species depends on the set of existing species

      ▸ e.g., birds could not have
        evolved before dinosaurs

  ▸ thus the possibility space
    continues to evolve itself

Figure 2.4. *Birds and reptile (image credit:*
https://reptiland.com/how-birds-and-reptiles-are-related/*)*

  ▸ the languages that existed
    beyond the time horizon of the comparative method

    ▸ probably actually were substantially different from today's
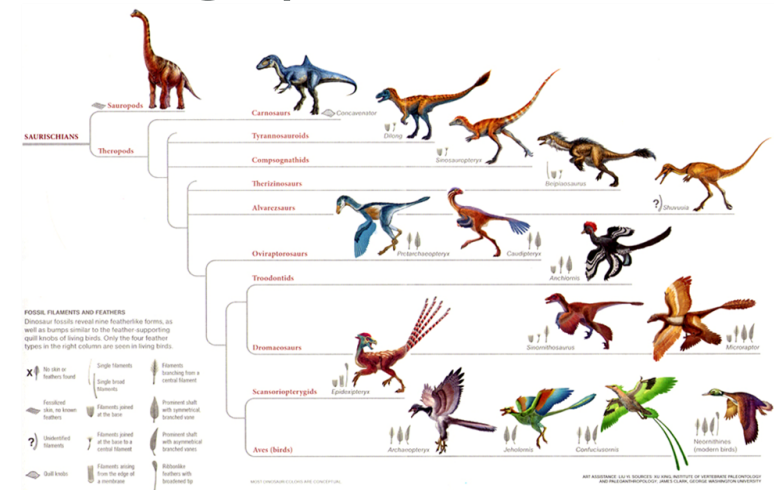
‣ predictions

Table 2.5. *Predictions generated by the proposed theory of functional expressions*

Type of functional expression	Discourse-prominent	Inherently backgrounded
Degree of grammaticalization	Weaker	Stronger
Typological distribution	Near-universal: expressed in any all-purpose language, either by a functional expression or compositionally	Variable to a degree that depends on just how redundant the type of expression is
Ex nihilo type innovation (type emergence in a genus without contact model)	Limited to transitions b/w compositional and non-compositional expressions	Unlimited

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SOME DATA

▸ discourse-prominent expressions

　▸ demonstratives have been argued to be present in all languages (Diessel 1999; Dixon 2003)

　　▸ exceptions arise in languages that use compositional expressions for exophoric reference

　　　▸ such as French and Yucatec

Table 3.1. *French demonstrative paradigms (Diessel 1999: 37)*

(3.1) Yucatec Maya (Mexico)

Máax	ti'a'l	**le=**lìibro	(he'l)**=o'**?
who	property(B3SG)	DEF=book	PRSV=D2

'Whose property is that book over there?'

	DEM PROS		DEM DETS	
	PROXIMAL	**DISTAL**	**PROXIMAL**	**DISTAL**
SG.M	*celui-ci*	*celui-là*	*ce livre-ci*	*ce livre-là*
SG.F	*celle-ci*	*celle-là*	*cette maison-ci*	*cette maison-là*
PL.M	*ceux-ci*	*ceux-là*	*ces livres-ci*	*ces livres-là*
PL.F	*celles-ci*	*celles-là*	*ces maisons-ci*	*ces maisons-là*

▸ similarly, independent pronouns are present universally

    ▸ though some languages
      have compositional pronoun stems

(3.1) Mundari (Mundar, India; Daniels 2013)
    a-ñ 'I'   a-liŋ 'we.DU'   a-le 'we.PL';
    a-m 'you.SG' a-ben 'you.DU'   a-pe 'you.PL

    ▸ Everett (2005) argues that Pirahã had no independent
      pronouns before borrowing some from Tupian languages

    ▸ Evans & Levinson (2009: 431) claim that

"Sign languages like ASL (American Sign Language) also lack pronouns, using pointing instead."

    ▸ Cormier et al. (2013) dispute this

▸ data from the Atlas of Pidgin and Creole Language Structures (Michaelis et al. 2013)

    ▸ all sample languages have expressions equivalent to

        ▸ demonstratives

            ▸ complex circumnominal forms often but not always involve augmentation with adverbs ('the/that N there')

        ▸ independent pronouns

        ▸ interrogative pro-forms

        ▸ negations

        ▸ frequency adverbs

        ▸ cardinal numerals

        ▸ adpositions (defined purely syntactically)

        ▸ verbal and NP conjunctions (defined purely syntactically)

▸ person and number distinctions are restrictors on pronouns

  ▸ so it is not surprising that there are counterexamples
     to Greenberg's Universal 42

  "All languages have pronominal categories involving at least three persons
  and two numbers" (Greenberg 1966: 96).

  ▸ e.g., Everett (2005) reports that Pirahã does not express
     number either in nouns or in pronouns

  ▸ there are eight languages in the APiCS sample
     w/ 1/2 or 2/3 syncretism (Haspelmath 2013)

     ▸ Cysouw (2009: 39-65) discusses additional examples

  ▸ similarly, 14 of 75 sample languages
   lack distance distinctions in demonstratives

▶ restrictors: APiCS and WALS

Table 3.1. *Some restrictor types in the APiCS and WALS databases*

Type of functional expression	Sample languages	APiCS Number of sample languages the type is attested in	Sample genera	WALS Number of sample genera the type is attested in
Case	76	15 (19.7%)	171	65 (38%)
Subject agreement	75	45 (60%)	173	123 (71.1%)
Nominal gender		No data	170	76 (44.7%)
Nominal number	76	71 (93.4%)	378	351 (95.9%)
Past tense	75	59 (78.7%)	156	92 (59%)
Definite article	76	57 (75%)	262	180 (68.7%)

▶ the distributions of case marking and subject agreement/ cross-reference are very roughly complementary

   ▶ this is not surprising, as head marking and dependent marking are alternative strategies

   ▶ but, this makes structural case and agreement an obvious example of overlapping/competing redundant categories
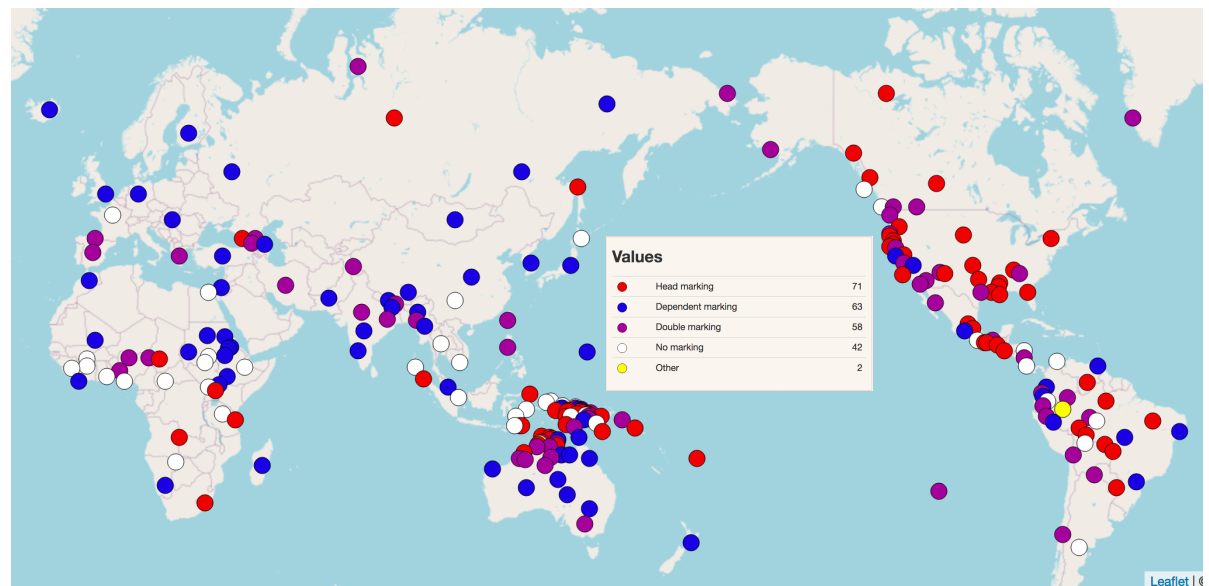
Figure 3.1. *Distribution of clause-level argument marking strategies (Nichols & Bickel 2013)*

▸ *"ex-nihilo"* innovations

  ▸ innovation of functional expressions not inherited from the genealogical ancestor in the absence of a contact model

    ▸ in practice, absence of the type of functional expression in question in the other members of the genus

      ▸ usually has to serve as a stand-in for evidence of absence of genealogical transmission

  ▸ prediction: innovations of discourse-prominent functional expressions are limited to transitions

    ▸ between compositional and non-compositional expressions

    ▸ in contrast, *ex-nihilo* innovation of inherently backgrounded functional expressions ought to be more common

▸ *"ex-nihilo"* innovations (cont.)

    ▸ evidence of *ex-nihilo* innovations of functional expressions is key proof of concept for any evolutionary theory

        ▸ *ex-nihilo* innovations directly attest to the evolvability of the particular type of expression

‣ a few attested examples of *ex-nihilo* innovations
of functional expressions

  ‣ Wälchli (2018) discusses the emergence of gender
  in Nalca (Mek, Tanah Papua)

  ‣ Egyptian likely innovated articles and structural case
  (Levin 1992; Eitan Grossman, p. c.)

  ‣ Gullah (creole, Carolinas and Georgia) has numeral classifiers
  (Mufwene 1986)

    ‣ but neither the lexifier nor any of the likely substrate languages does

  ‣ Matthew Dryer (p. c.) reports the innovation of an imperative mood
  out of an irrealis mood

    ‣ and a diminutive out of a neuter gender in Walman (Torricelli, PNG)

OUTLINE

▸ A typological puzzle

▸ A theory of functional expressions

▸ Some data

▸ An evolutionary model of grammaticalization

▸ Supporting evidence: the ecology of definiteness marking

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AN EVOLUTIONARY MODEL OF GRAMMATICALIZATION

▸ traditional grammaticalization theory (GT)

   ▸ grammar is the result of grammaticalization

   ▸ grammaticalization involves unidirectional change along loosely correlated scales

      ▸ of metaphoric extension, semantic bleaching, and morphophonological reduction

         ▸ Lehmann 1982; Heine & Reh 1984; Hopper 1981; *inter alia*

Table 4.1. *Grammaticalization processes (Croft 2000: 157)*

|	
Phonological	
Paradigmatic:	*attrition*: reduction/erosion > phonological loss
Syntagmatic:	*coalescence*: free morpheme > cliticization, compounding > affixation > loss
	adaptation (including assimilation)
Morphosyntactic	
Paradigmatic:	obligatorification > fossilization > morphological loss
	paradigmaticization: open class > closed class > invariant element
Syntagmatic:	*rigidification* [word order]
	loss of independent syntactic status > morphological fusion > loss
Functional	
Paradigmatic:	extension of semantic range > loss of function
Syntagmatic:	*idiomaticization*: compositional & analyzable > noncompositional & analyzable > unanalyzable

▸ GT takes a "ballistic" view of grammaticalization

  ▸ the output of grammaticalization processes is seen as constrained only by the input

    ▸ and by **mutational constraints** (Haspelmath 1999)

      ▸ i.e., by the available pathways of grammaticalization and the unidirectionality of grammaticalization

▸ mutational constraints alone cannot account for the differential typological distribution of functional expressions

  ▸ the sources of the grammaticalization of inherently backgrounded expressions are lexical expressions

    ▸ and discourse-prominent functional expressions

  ▸ since both of these are universally available, why would backgrounded functional expressions not also be?
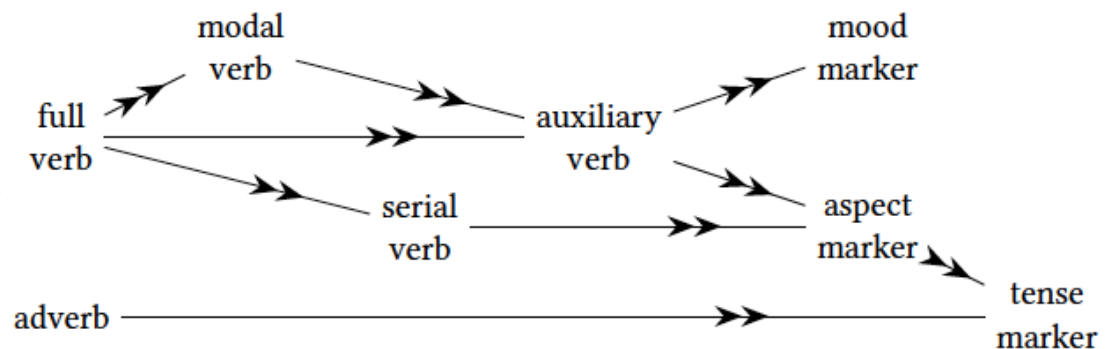
Figure 4.1. *Some grammaticalization pathways in the verbal domain (Lehmann 2015: 39)*

▸ to account for the observable typological distribution of functional expressions

　▸ GT must be retrofitted with **functional-adaptive constraints** (Haspelmath 2019)

　　▸ i.e., constraints that boost the grammaticalization of expressions that are optimized for communicative fitness

▸ Hawkins (2014: 86) identifies three elements
of functional-adaptive mechanisms in language change

    ▸ based on Haspelmath (1999a)

▸ speakers have a choice from among competing structural
alternatives for communicating the same message

▸ selection among these is biased
in terms of 'user optimality', i.e., communicative fitness

▸ this boosts the usage frequency of the fitter options,
causing regularization and obligatorization

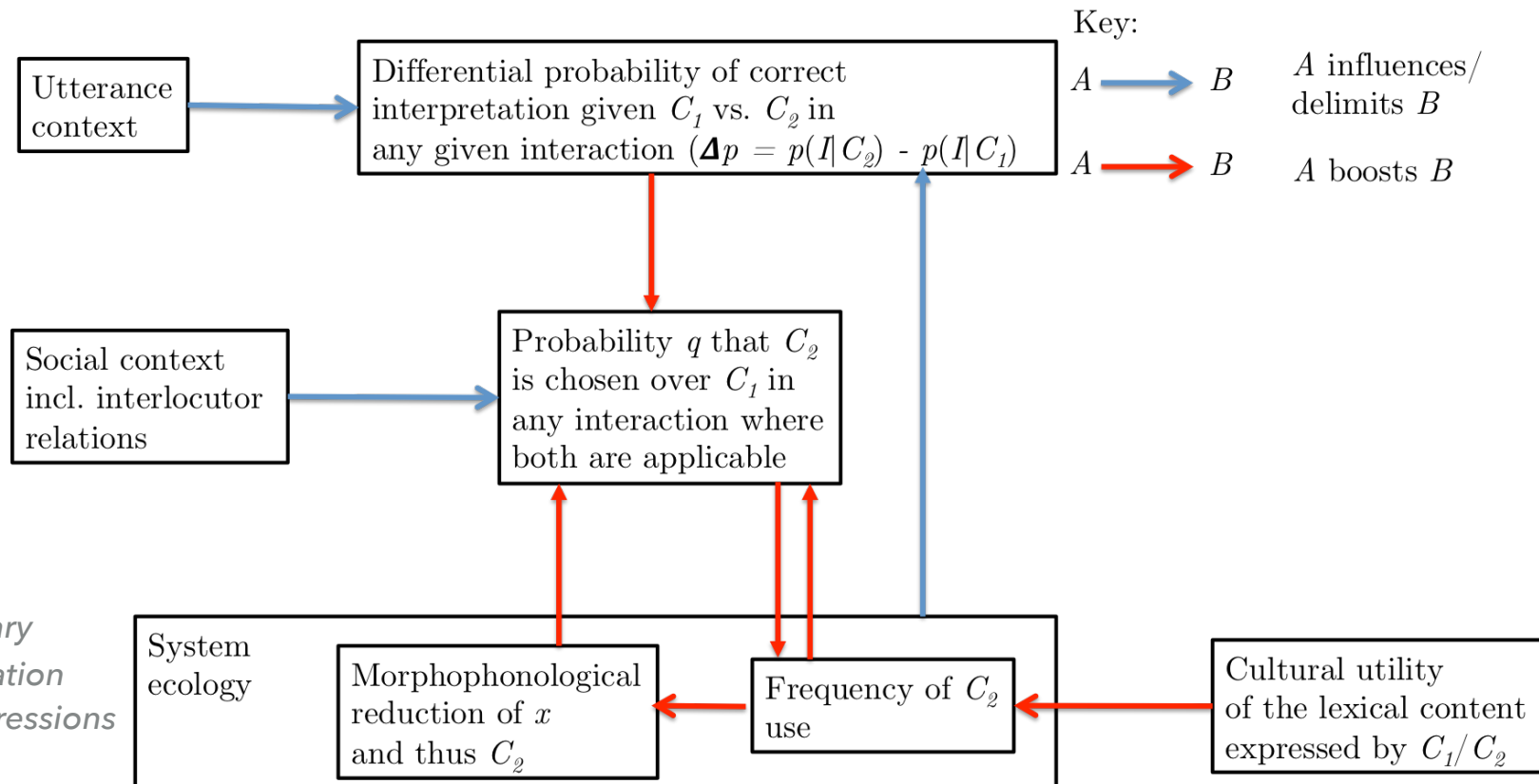   ▸ and potentially eventually the loss of the competitors

▸ **a variety of different evolutionary models of language change have been proposed recently**

Table 4.2. *A typology of evolutionary models of language change*

Assumed primary "agents" of language change Specificity of the model	(Primarily L1) Learners	(Primarily adult) speakers	Both learners and speakers
Narrow analogy to biological evolution (causal model)	Deacon (1997)	Croft (2000)	Christiansen & Chater (2008, 2016)
Broad – language as a 'complex adaptive system'	Kirby (1999); Reali & Christiansen (2009); Fedzechkina et al. (2012)	Haspelmath (1999); Hawkins (2014); Pierrehumbert (2001)	Beckner et al. (2009)

▸ # sketching an explicit causal model

Assume a contrast between two expressions C_1 and $C_2 = C_1 + x$, both of which could be used to express the speaker's communicative intent. The addition of x to C_1 is licensed by an existing construction of the language. Its use in C_2 is redundant wrt. the speaker's communicative intent, but increases the probability p of the hearer inferring the intended meaning I ($p(I|C_2) > p(I|C_1)$). E.g., x could be a demonstrative added to indicate definiteness, a perfective aspect marker to indicate past time reference, or an allative case marker to indicate a syntactic object relation.

Key:

| Utterance context | Differential probability of correct interpretation given C_1 vs. C_2 in any given interaction ($\Delta p = p(I|C_2) - p(I|C_1)$) | $A \longrightarrow B$ | A influences/ delimits B |
| | | $A \longrightarrow B$ | A boosts B |

Social context incl. interlocutor relations → Probability q that C_2 is chosen over C_1 in any interaction where both are applicable

System ecology

Morphophonological reduction of x and thus C_2

Frequency of C_2 use

Cultural utility of the lexical content expressed by C_1/C_2

**Figure 4.2.** *An evolutionary model of the grammaticalization of redundant functional expressions*

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SUPPORTING EVIDENCE: THE ECOLOGY OF DEFINITENESS MARKING

▸ Evers (2020): rationale

  ▸ if the grammaticalization of inherently backgrounded functional expressions is a functional adaption

    ▸ it should occur where there are functional "niches" for it

      ▸ and not elsewhere

  ▸ so it should be possible to predict which languages grammaticalize e.g. definite articles and which don't

    ▸ on the basis of the presence/absence of alternative morphosyntactic definiteness cues

▸ grammar sampling study: generating the sample

  ▸ a sample of 100 languages were randomly selected by an algorithm introduced in Dryer (2018)

    ▸ based on two criteria

      ▸ availability of a recent extensive description

      ▸ at least 30 languages spoken geographically in between each pair of adjacent languages
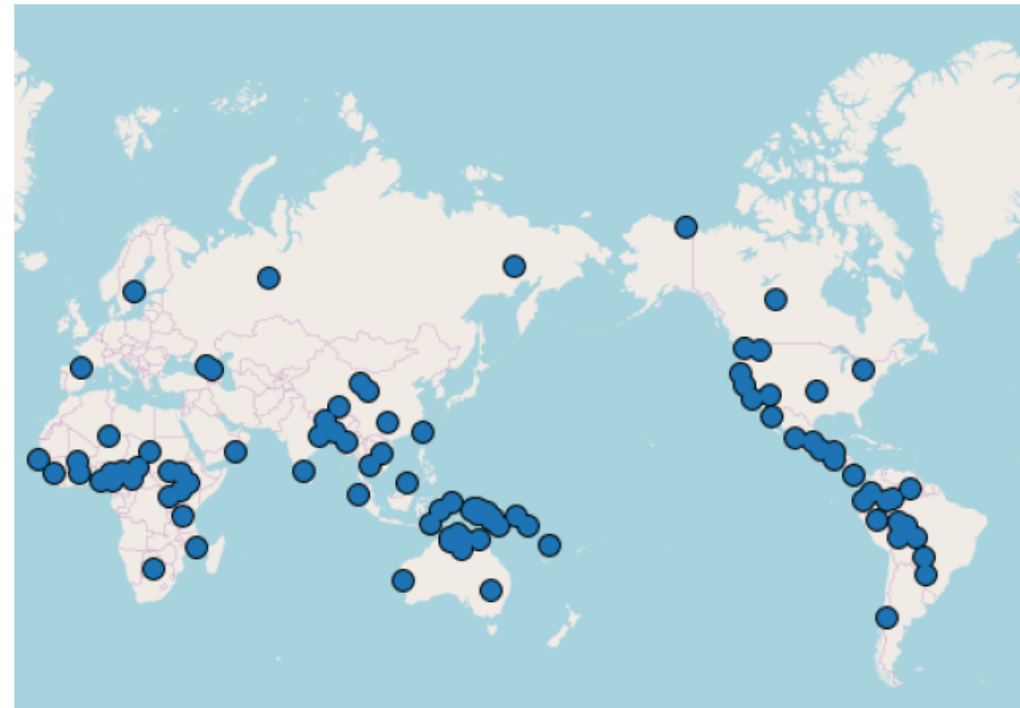
Figure 5.1. *Map of the language sample of Evers (2020: 125)*

▸ grammar sampling study: procedure

  ▸ manually coding the sample languages for 8 variables
    selected from an original 16 after a pilot study

    ▸ on a sample of 32 languages
      at a distance of 50 languages in between

  ▸ run machine learning models to identify
    the strongest predictors of absence of definite articles

Case	Differential Object Marking
Gender	Noun Classifiers
Perfective Aspect Marking	Switch Reference
Prodrop	Verb Agreement
Isolating	Ergativity
Focus Marking	Topic Marking
Flexible Subject Order	VO Word Order
Affixation Order	Indefinite Article

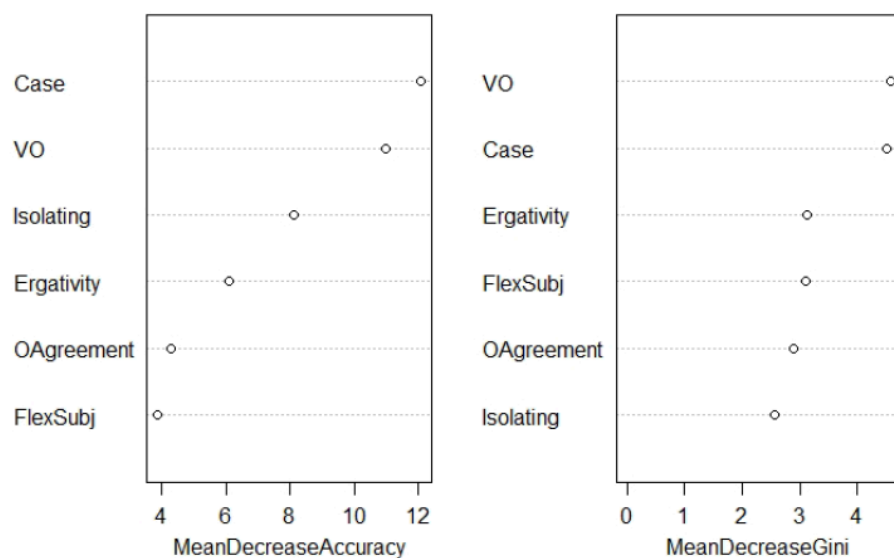| Alignment	Case Marking
Morphological Complexity	Object Agreement
Order of Object and Verb	Subject Order Flexibility
Switch Reference	Topic Marking

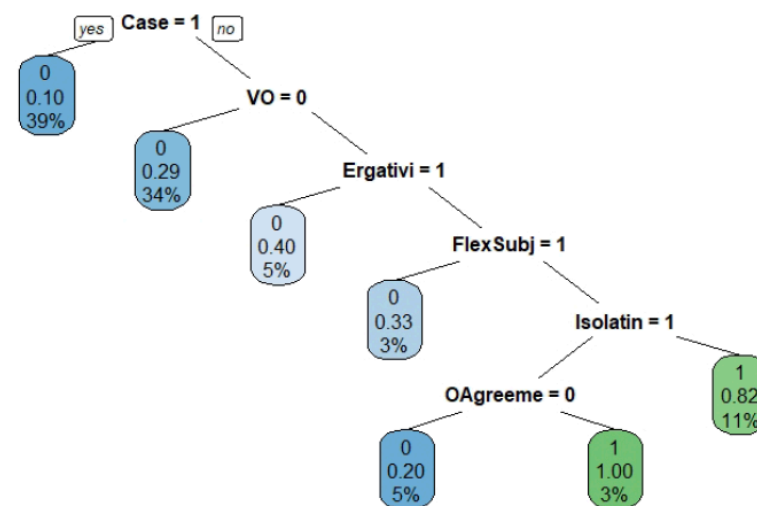**Figure 5.2.** *Pilot (left) and final set of independent variables (Evers 2020: 88, 126)*

▶ # grammar sampling study: findings

Figure 5.3. *Random forest models of the main sample predicting **absence** of definite articles (Evers 2020: 135)*

Figure 5.4. *Conditional inference tree of the main sample predicting **absence** of definite articles (Evers 2020: 136)*

▸ Evers followed this analysis up with two corpus studies

  ▸ on Kalaallisut (Eskaleut, Greenland)
    and Colloquial Jakarta Indonesian (CJI)

    ▸ both of which lack definite articles

  ▸ she manually coded discourses in both languages

    ▸ and ran classifiers predicting definiteness

  ▸ she found that models accurately predicted definiteness in

    ▸ 78% of arguments in CJI

    ▸ 90% of arguments in Kalaallisut

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SUMMARY

▸ there are two types of functional expressions
in the languages of the world

  ▸ discourse-prominent expressions are capable of
expressing at-issue content

    ▸ i.e., part of the speaker's intended message

  ▸ they share this property with lexical expressions

    ▸ but differ from them in terms of their combinatorial
properties and abstract, syncategorematic semantics

▸ in contrast, inherently backgrounded functional expressions
  are communicatively redundant to varying degrees

  ▸ their primary purpose is to boost the odds
    that the hearer will infer the intended meaning

  ▸ their function is thus primarily metalinguistic
    and they tend to be more strongly grammaticalized

▸ discourse-prominent functional expressions are distributed near-universally across the languages of the world

    ▸ every "all-purpose" language expresses the relevant meanings either compositionally or non-compositionally

▸ in contrast, inherently backgrounded functional expressions display considerable typological variation

    ▸ and it appears that the extent of this variation correlates with the extent of their backgrounding/redundancy

    ▸ evidence from *ex-nihilo* innovations further supports this conclusion

        ▸ and represents direct evidence of the evolvability of functional expressions

▸ theories of grammaticalization that take into account only sources and mutational constraints

  ▸ cannot explain the typological distribution of functional expressions

  ▸ to do this, grammaticalization theory requires an upgrade with an evolutionary module of functional selection

▸ evidence in support of the idea that inherently backgrounded functional expressions evolve where they fill functional niches

　▸ comes from a typological study using machine learning models to predict the absence of definite articles

　　▸ on the basic of competing alternative definiteness cues

OUTLINE

▸ Emotions

▸ Heider on interpersonal emotions

▸ Force dynamics of emotion

▸ Semiotics of emotion in language

▸ Emotion across cultures

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▸ None but me should be presumed to agree with, or be responsible for, any of the material

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