

## Lecture 5

### Function and System

A. The Issue    B. Structure, Function, and Grouping    C. The Existence of Structure  
D. The Primacy of Function    E. Systems

#### A. The Issue

- (1)(a) The relation between **structure** (or *form*) and **function** is a general and fundamental issue.
- (b) An object's structure lets it serve a certain function. This function determines its form.
- (c) For language, *structure* is often identified with **grammar**, and *function* with **meaning**.
- (d) More broadly, *structure* includes lexicon, morphology, and phonology; *function* includes pragmatics and discourse functions (e.g. the introduction of a new discourse referent).
- (2)(a) In linguistics, the division between **formalist** and **functionalist** approaches is basically a matter of how closely structure and function are thought to be related.
- (b) The formalist view is that language structure has enough *autonomy* to be describable independently of functional considerations (the **autonomous syntax hypothesis**). These are important, but require a *prior* description of structure (or *form*).
- (c) In the functionalist view, structure cannot be described or understood independently of function. Structure is essentially just a means of fulfilling or *implementing* functions.
- (d) The CG position is that structure and function cannot be distinguished at all—they are **indissociable**. Function inheres in structure, being an essential aspect of it.
- (3)(a) The classical notion of **constituency** (reflected in generative “tree structures”) is based on the metaphor of **composition**, where “building blocks” are combined into larger and larger structures at successive hierarchical levels.
- (b) The compositional metaphor suggests a **bottom-to-top** path of mental access. However, language processing does not proceed rigidly or exclusively in this direction. Hierarchical organization is only one aspect of symbolic assemblies and is not inherently directional.
- (c) Linguistic structures of any size have to be characterized not only in **bottom-up** fashion, pertaining to the *parts and their arrangement*, but also in **top-down** fashion, pertaining to *how the structure functions in a larger whole* (Harder 2010).
- (4) Considerations suggesting that the formalist outlook is problematic:
  - (a) It is inconsistent with the notion that grammar is symbolic and thus meaningful.
  - (b) Grammaticality judgments are notoriously unreliable and usually involve semantic factors.
  - (c) A purely formal account offers no insight as to why grammar should be like it is.
  - (d) Composition cannot be exclusively bottom-up, as lower-level choices depend on what is envisaged as the higher-level outcome.
  - (e) Syntactic constituency is flexible, variable, and non-exhaustive of grammatical structure—not the strict, consistent, and exhaustive hierarchical arrangement commonly assumed.
  - (f) A higher-level grammatical structure may have no consistent characterization in terms of its internal parts and their arrangement. The common feature is semantic function.
  - (g) A strictly compositional view of semantics is problematic because of (i) emergent aspects of meaning, (ii) specifications not contributed by component elements, and (iii) meanings consisting primarily in an expressive or interactive function.

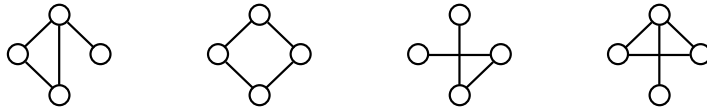
- (5)(a) The view of grammar as an autonomous formal system stands in direct conflict with the central CG claim that grammar is inherently meaningful.
- (b) It is supported by an immense body of work that proposes and justifies explicit semantic values for basic categories and a wide range of grammatical markers (e.g. *be* and *-ing*).
- (6)(a) If grammar is an autonomous formal system, describable independently of meaning, speakers should be able to assess grammaticality in those terms.
- (b) But grammaticality judgments are unreliable. Moreover, most cases of “ungrammaticality” involve some kind of semantic inconsistency, e.g. *\*He are tall*.
- (c) The requirement is for consistency in the semantic specifications attributed to the subject referent. When the subject can be construed in different ways, the verb can vary accordingly: *Greed and corruption {is / are} hurting the economy*.
- (7)(a) Describing the form of grammar prior to examining its function makes the analysis harder. It is easier to describe something properly if we understand the functions that shape it.
- (b) A participle requires *be* to head a finite clause: *He is working* vs. *\*He working*. Why?
- (c) A clause profiles a **process**, where a relationship is scanned **sequentially** through time. A participle has the semantic function of viewing it **holistically** from a certain perspective.
- (d) *Be* serves the clausal function of tracking this perspectival relationship through time.
- (8)(a) The compositional metaphor suggests that an expression’s composite meaning emerges only at the end, **resulting** from the compositional process rather than **guiding** it.
- (b) An example of top-down influence: *[What she bought him] was {expensive / irrelevant}*.
- (c) Structure consists in *symbolic assemblies*. Assuming any single path of access would be simplistic—what counts is the coherence of the overall conception that emerges.
- (9)(a) A case of variable constituency: *The package that you were expecting just arrived* vs. *The package just arrived that you were expecting*.
- (b) Consistent grammatical constituency, allowing identification of the subject nominal, is possible only at the theoretical cost of positing underlying structure and derivations.
- (c) *The package ... that you were expecting* is a *nominal* because it fulfills the function of nominal reference, and the clausal *subject* because it specifies the verb’s trajector.
- (d) The initial prosodic grouping serves either the **descriptive** function of identifying a nominal referent or the **discursive** function of introducing a new referent in the discourse.
- (10)(a) Grammatical structures cannot be consistently characterized in terms of component parts and their arrangement (e.g. NOMINAL = DETERMINER + HEAD NOUN).
- (b) There is no set of parts that all nominals share: *the package* (DETERMINER + HEAD NOUN), *packages* (no determiner), *those wrapped in newspaper* (no head noun).
- (c) The only common feature is the semantic function of nominal reference.
- (11) In the formalist view, an expression’s meaning (like its form) consists in a **structure** derived compositionally from component elements. This has certain problems:
- (i) It makes no provision for emergent aspects of meaning (due to metaphor, metonymy, contextual interpretation, or background knowledge).
- (ii) Crucial aspects of meaning are sometimes not inherited from any component element (e.g. relations of possession or referential identity being indicated by mere adjacency).
- (iii) There is no obvious place for elements like *ouch* or *hello*, whose meanings consist primarily in an **expressive** or **interactive function** served by their utterance.

## B. Structure, Function, and Grouping

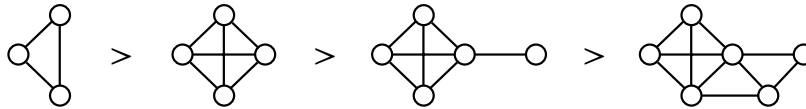
- (12)(a) Properties of a typical structure (e.g. a hammer): (i) It is a physical object, consisting in substance and occupying space. (ii) It has a limited number of connected parts arranged in a certain way. (iii) The parts and their arrangement are stable through time.
- (b) A linguistic or conceptual structure consists in processing activity: (i) It comprises a set of entities in any domain of experience. (ii) These are connected in a certain way through mental operations (including spreading activation). (iii) Their arrangement is stable in the sense of manifesting recurring patterns of activity (units, or cognitive routines).

(13)

(a) Different structures formed by connecting elements in alternate ways



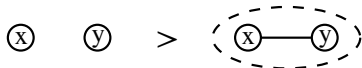
(b) Augmentation of structure by adding more elements and connections



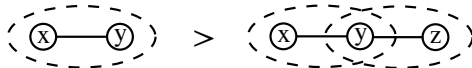
- (14)(a) Connection produces a **new entity** representing a *higher-level of organization*.
- (b) The higher-level entity has **emergent properties**, minimally including the nature of the connections and any adjustments the component elements undergo.
- (c) A component of a higher-level entity may participate **individually** in further connections.
- (d) A higher-level entity (being a structure in its own right) can also participate **as a whole** in further connections. This is so when the connections depend on *emergent properties*.
- (e) When this happens at successive levels of organization, the result is **hierarchy**.

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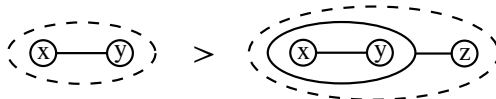
(a) Connection producing a higher-level entity



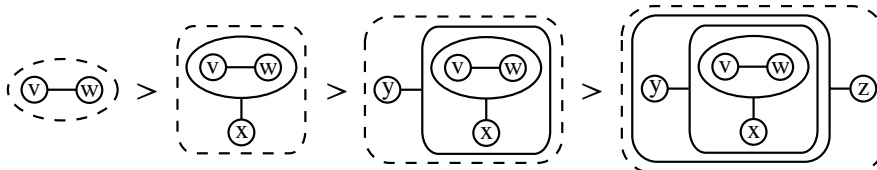
(b) Component element participating individually in another connection



(c) Higher-level entity participating as a whole in another connection

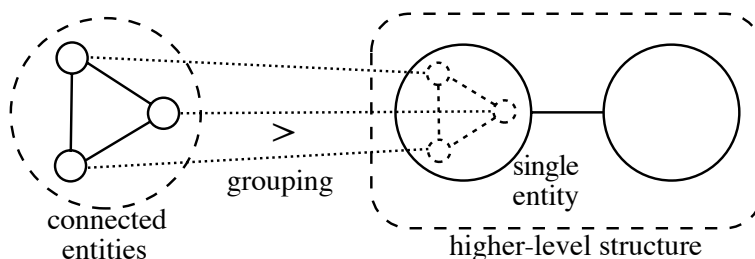


(d) New entities emerging at successive levels of organization (hierarchy)



- (16)(a) In principle, every connection defines an implicit structure with the *potential* to participate as a whole in further connections (defining larger structures).  
 (b) *Exploiting that potential* consists in activating the structure so that (as a whole) it plays an actual role in higher-level processing.  
 (c) A structure's **function** is simply its role in the structure that emerges at the higher level.  
 (d) Having a higher-level function is equivalent to **grouping**, in which multiple entities function as a single entity (i.e. as a whole) for some higher-level purpose.  
 (e) While the structure fulfilling a function is sometimes established on independent grounds, the function itself may be the only basis for grouping the component elements.

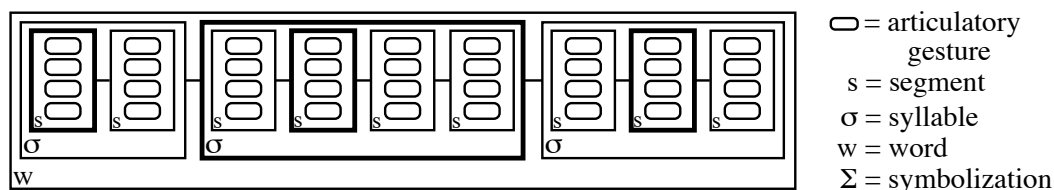
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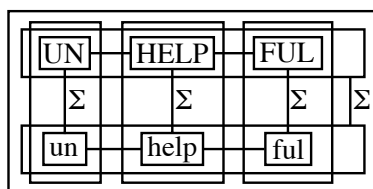
- (18)(a) The **informational focus**, marked in English by unreduced stress, is that portion of an expression which represents *significant new information*. It has the *discursive function* of indicating which portion of the utterance demands attention.  
 (b) JACK DEVoured a PIZZA. He ate it very QUICKLY.  
 (c) JILL ORDERed SPAGHETTI. She ATE it very SLOWLY with a lot of SAUCE.  
 (d) The elements of a *discontinuous focus* serve this function collectively (as a whole) rather than individually. The function itself is responsible for their grouping.

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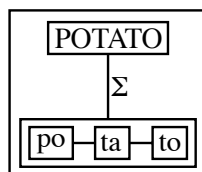
(a) Hierarchy of unipolar phonological structures



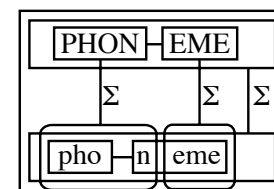
(b) Symbolic connections made with individual elements



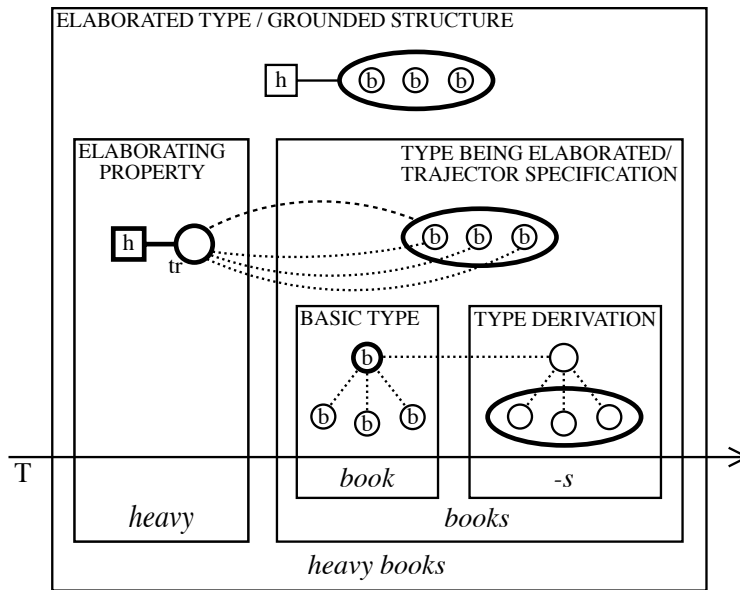
(c) Symbolic connection only with the whole



(d) Grouping solely due to symbolization



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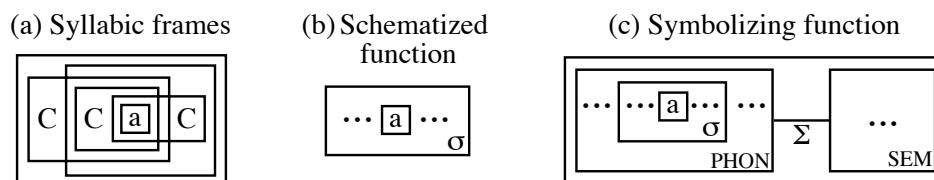


### C. The Existence of Structure

- (21)(a) Structure and function are **indissociable** (like the two sides of a coin): they are *associated* and cannot be *disassociated*.
- (b) Any connection implicitly defines a higher-level entity with emergent properties, which has the potential to function as a whole in further connections (defining larger structures).
- (c) It is only when that potential is *exploited*—when it *does* function as a whole—that we have any basis for recognizing it as a linguistically significant structure.
- (d) Thus a structure is never independent of its functions. Conversely, functions require structures for their implementation.
- (22)(a) Ultimately, structure and function are not distinct, but represent different perspectives on the same phenomena. Still, both are essential for a full understanding.
- (b) We cannot specify the function of structure A in structure B without an actual description of B, being explicit about its parts and their arrangement.
- (c) And without an actual description of structure A, we cannot be precise or explicit about its role in B, or how it is able to fulfill this role.
- (d) By fully describing both A and B, we also describe A's function in B. Rather than being separate and distinct, a functional characterization is inherent in a structural description.
- (e) Still, the functional perspective is essential. And when the same function is fulfilled by different structural means, it has to be characterized independently.
- (23)(a) The *structure* of a **vowel** consists in a coordinated set of articulatory gestures producing a brief pulse of (relatively) stable sonority with energy concentrated at certain frequencies. Its main *function* is as the nucleus of a syllable.
- (b) A **syllable** comprises the nucleus—a pulse of sonority, its essential and most salient element—and associated consonants (which modulate this sonority).
- (c) A vowel's structure allows it to function as syllabic nucleus. Given the descriptions of a vowel and a syllable, this function is automatic (it need not be stated separately).

- (24)(a) We can speak of a vowel's function even in a **metalinguistic** use, e.g. *the vowel [a]*. In the context of this phrase, it functions as THE LINGUISTIC ELEMENT NAMED.
- (b) A vowel functions as nucleus in certain types of syllables. Its full characterization includes **syllabic frames** (schematic syllables) representing these patterns.
- (c) By occurring in a variety of frames (structural contexts), it is independent of any particular one—to some extent it is **decontextualized**.
- (d) A maximally general (schematic) description of its function is only minimally different from a description of its structure.

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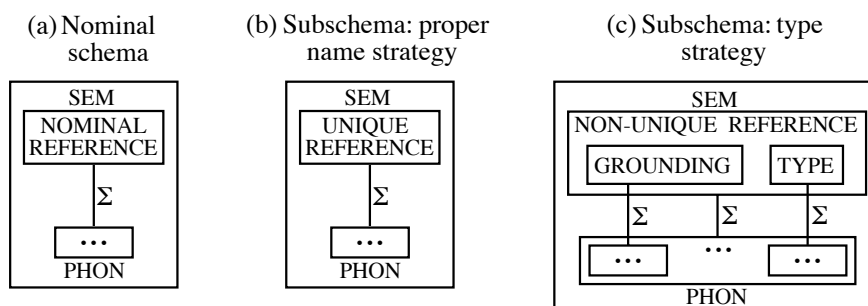


- (26)(a) As part of symbolic structures, a vowel contributes to their *symbolizing* function.
- (b) It can do so **directly**, standing alone as a symbolic unit's phonological pole. E.g. [ʌ] conveys hesitation and the intention of continuing (*That's ... uh [ʌ] ... not quite true*).
- (c) It usually contributes only **indirectly**, as part of a larger structure (syllable or word) all or a portion of which functions as a symbolic structure's phonological pole.
- (d) Though indirect and extrinsic, this function is relevant to understanding what a vowel is (analogous to saying that a hammer plays an important role in the building of a house).
- (27)(a) A lexical item, e.g. *book*, has a **symbolic function**. Its semantic and phonological poles represent the **subfunctions** of *symbolized conception* and *symbolizing expression*.
- (b) When a lexeme occurs in multiple constructions, it has a different function in each. Its full description includes its role in these **structural frames**.
- (c) A lexeme that occurs in many and varied frames may be independent of any particular one (they are not necessarily activated by it)—a high degree of **decontextualization**.
- (d) *Book* can be pluralized (*books*), directly grounded (*my book*), or part of a compound (*bookstore*). It also occurs alone as a *citation form* (like in a dictionary).
- (e) An element occurring in just one construction, like plural -s, can hardly fail to activate it.
- (28)(a) A language comprises a vast **assembly** of connected structures; some are *parts* of others, some are schemas *immanent* in others.
- (b) A linguistic structure is never self-contained: it is embedded in this assembly, has a certain position in it, and could not exist independently of it.
- (c) For example, a vowel has several kinds of connections with other structures:
- It is connected with other vowels through the schema which they all instantiate.
  - It is constituted by its parts and their arrangement, without which it would not exist.
  - It is connected with other sound segments as part of larger phonological structures.
  - Through such structures, it is connected with meanings in symbolic relationships.
- (d) A structure can thus be thought of as a **point of entry** into the assembly, all elements of which are connected to it at varying distances.
- (e) How much of the assembly it includes depends on what we are trying to analyze.

## D. The Primacy of Function

- (29) If either function or structure has a claim to being primary, it is function:
- (a) It is only when something functions as a whole that we have grounds for recognizing it as a linguistically significant structure.
  - (b) Structure exists to serve semantic and communicative functions. It makes no sense to say that functions exist in order to be implemented by structures.
  - (c) There are functions of definite linguistic importance which cannot be characterized in structural terms, their structural implementations having nothing in common.
  - (d) Semantic function is essential for grammar. It proves to be more fundamental and more consistent than grammatical constituency.
- (30)(a) A function is like a **task** to be accomplished. It can be broken down into subtasks, those into sub-subtasks, etc. So to some extent functional organization is **hierarchical**.
- (b) The same structure can function in different higher-level structures, resulting in **decontextualization**. Conversely, the same function can be implemented by different lower-level structures, resulting in **destructuralization**.
  - (c) This happens when the lower-level structures have nothing in common because they represent different **strategies**. (*There's more than one way to skin a cat.*)
- (31)(a) A **nominal** serves the semantic function of **nominal reference**: it establishes a certain *thing* as the intersubjective focus of attention (momentarily shared by the interlocutors).
- (b) This task can be accomplished by structures reflecting different semantic strategies: a proper name (*Li Fuyin*), a pronoun (*it*), a lexical noun with grounding (*these books*), a plural noun (*linguists*), or a demonstrative and a modifier (*those with children*).
  - (c) There being no common structural element, the function is *destructuralized*. But as the schematic characterization of nominals—one that applies to all cases—it is clearly linguistically important, belonging to the vast assembly comprising language structure.
  - (d) This is unproblematic, since linguistic units can be semantic, phonological, or symbolic, and range from highly specific to maximally schematic.

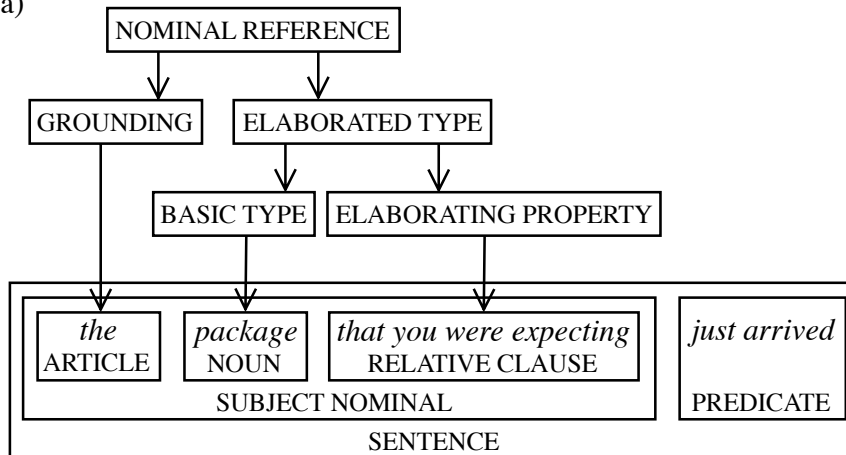
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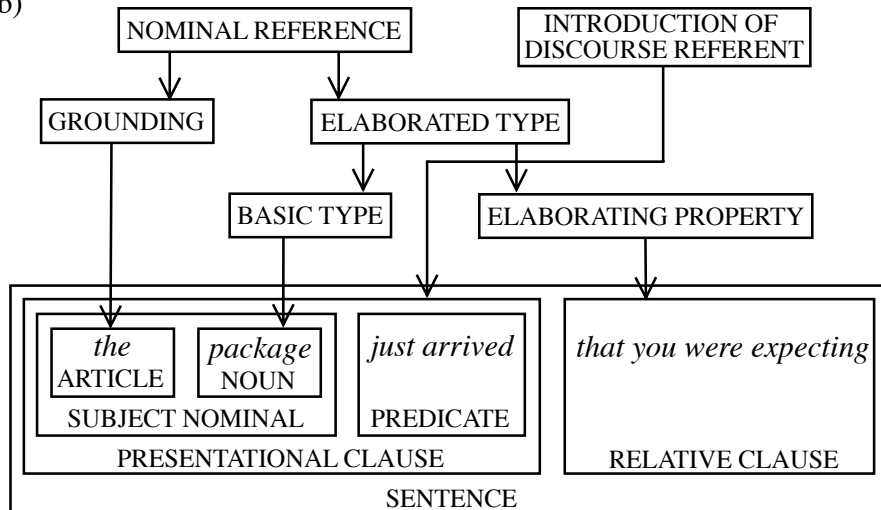
- (33)(a) Semantic function is essential for grammar, more so than constituency.
- (b) Despite variable constituency, functions provide consistent characterizations of basic grammatical notions like nominal, subject, and relative clause.
  - (c) These functions are organized hierarchically into subfunctions, sub-subfunctions, etc.
  - (d) Not every functional grouping is symbolized directly by an independently observable phonological grouping. This is unproblematic with symbolic assemblies.

(34)

(a)



(b)



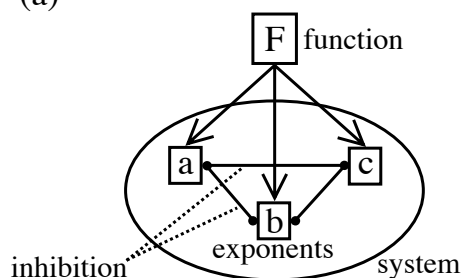
## E. Systems

- (35)(a) The set of elements that fulfill a certain function constitute a **system** (e.g. the *vowel system* of a language). These elements are **exponents** (or **members**) of the system.
- (b) The exponents of a system are **mutually exclusive**, standing in **opposition** to one another. In neural terms, they are connected by *inhibitory* (rather than *excitatory*) links.
- (c) A system's members are partially defined by what they are **not**—their place in a *system of oppositions*. In the system [i a u], [i] is partly defined by not being [a] or [u].
- (d) Exponents are usually very similar: contrasting instantiations of the same schema.

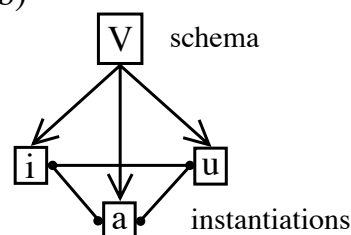


(36)

(a)



(b)



(37)(a) Systems vary in their **degree of integration**, based on the number of members, their similarity, the importance of oppositions, and the extent of organization into cross-cutting subclasses reflecting dimensions of contrast.

(b) A basic vowel system like [i e a o u] is highly integrated. Subclasses: HIGH [i u] vs. NON-HIGH [e o a]; FRONT [i e] vs. BACK [u o a]; and ROUNDED [o u] vs. UNROUNDED [i e a].

(c) Consonants are more loosely integrated. There are more of them, they are more diverse, and opposition is less important—we identify [č] more by intrinsic properties than its opposition to [l] or [h]. Organization into subclasses—like STOP vs. FRICATIVE, VOICED vs. VOICELESS—is less systematic (e.g. nasals do not contrast for voicing).

(d) The English demonstrative system is highly integrated, organized into PROXIMAL (*this, these*) vs. DISTAL (*that, those*) and SINGULAR (*this, that*) vs. PLURAL (*these, those*).

(e) The system of lexical nouns is very loosely integrated, with thousands of members. Their organization into subclasses is neither comprehensive nor exhaustive of their properties.

(38)(a) Often a narrowly defined function is implemented by a tightly integrated **core system**, which is part of a more loosely integrated system associated with a broader function.

(b) *Demonstratives* are a core system within the broader system of *determiners*, which also includes articles (*the, a*), quantifiers (*all, every, any*), and possessor nominals (*Sally's*).

(c) For the function of syllabic nucleus, a system might include both *simple vowels* (the core system) and *diphthongs* (vowel + glide combinations): [[i e a o u] aw ay ew ey oy].

(39)(a) **Grouping, function, and categorization** are related: elements are *grouped* to form a *category* on the basis of either intrinsic properties or because they *function* alike.

(b) Similar elements tend to function alike. Thus it is common for the exponents of a system to instantiate a schema based on intrinsic properties.

(c) **Systemic organization** is not distinct from **categorization**—it is categorization from the standpoint of **extrinsic** factors (*function* as opposed to *structure*).

(d) A **unified account** is proposed in which *structure, function, systems, categorization*, and even *composition* represent different perspectives on the same vast assembly.

(40)(a) **Alternative subfunctions** are *mutually exclusive* ways of fulfilling a function.

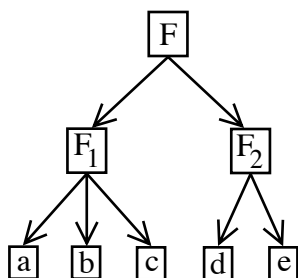
(b) **Component subfunctions** fulfill a function *jointly*. They represent a *construction*.

(c) Because the same elements participate in both sorts of hierarchies, they can be seen as aspects of the same overall assembly of connected structures.

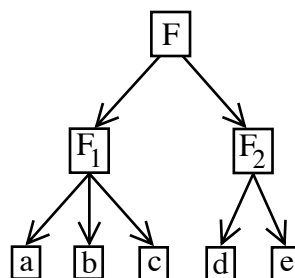
(d) An *alternative subfunction* may also be one *component* of another alternative.

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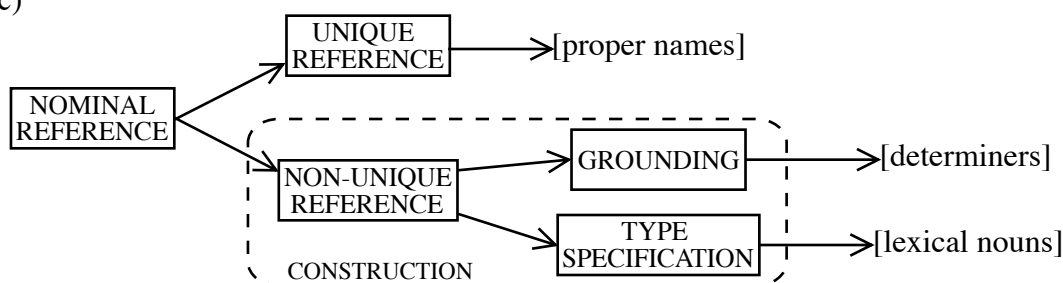
(a) Alternative Subfunctions



(b) Component Subfunctions

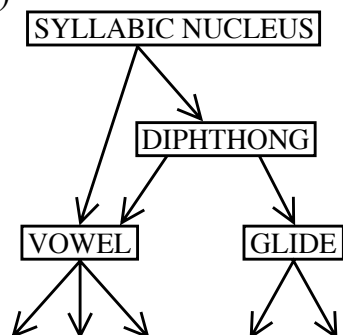


(c)

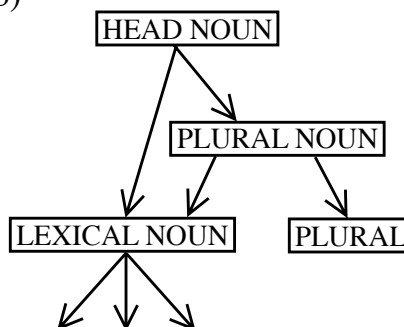


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(a)



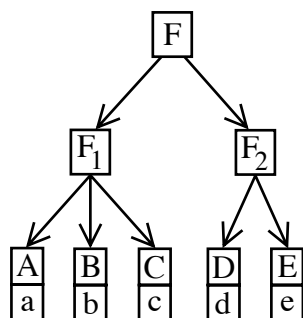
(b)



- (43)(a) Component subfunctions, each with a system of alternatives, define a **paradigm** of possible combinations, alternative means of fulfilling the higher-level function.
- (b) Ideally, every combination is permitted, each exponent is symbolized in a consistent manner, and it is clearly evident in the composite expressions. But there are many departures from this ideal. Paradigms can be highly irregular.
- (c) In grammatical paradigms, the exponents are **symbolic**; both poles have to be considered. A paradigm can be quite regular from the standpoint of semantic functions even though the regularity is not reflected, or is even obscured, in their symbolization.
- (d) Semantic functions are as much a part of linguistic structure as their symbolizing forms. They are more fundamental and more consistent than their formal manifestation.

## (44) Ideal paradigm

(a) Systemic view



(b) Paradigmatic view

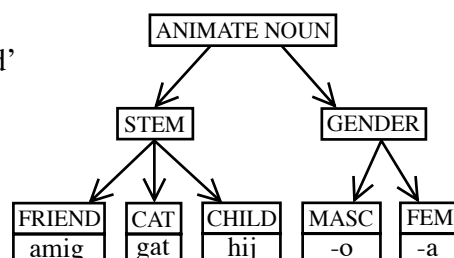
F		F <sub>2</sub>	
		D	E
F <sub>1</sub>	A	ad	ae
	B	bd	be
	C	cd	ce

## (45) Spanish

(a) Expressions

*amigo* '(male) friend'  
*amiga* '(female) friend'  
*gato* '(male) cat'  
*gata* '(female) cat'  
*hijo* 'son'  
*hija* 'daughter'

(b) Systemic view

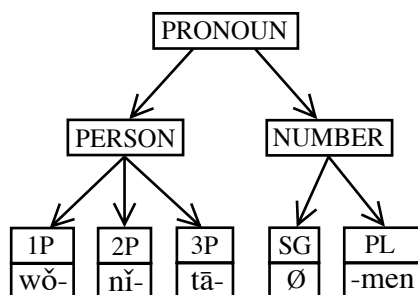


(c) Paradigmatic view

	ANIMATE NOUN	GENDER	
		MASC	FEM
STEM	FRIEND	amigo	amiga
	CAT	gato	gata
	CHILD	hijo	hija

## (46)

(a) Systemic view



(b) Paradigmatic view

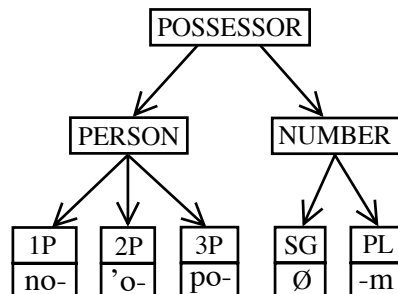
PRON		NUMBER	
		SG	PL
PERSON	1P	wǒ-∅	wǒ-men
	2P	nǐ-∅	nǐ-men
	3P	tā-∅	tā-men

## (47) Luiseño

(a) Expressions

*no-* 'my'  
*'o-* 'your'  
*po-* 'his/her/its'  
*čam-* 'our'  
*'om-* 'your (PL)'  
*pom-* 'their'

(b) Systemic view



(c) Paradigmatic view

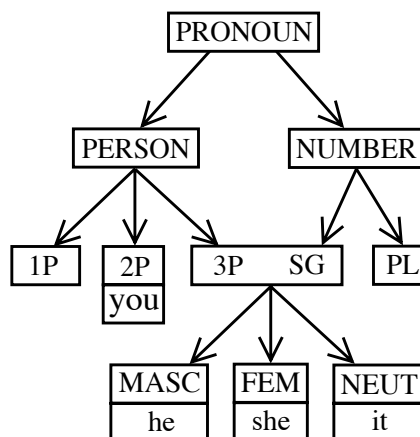
	POSSR	NUMBER	
		SG	PL
PERSON	1P	no-∅-	ča-m-
	2P	'o-∅-	'o-m-
	3P	po-∅-	po-m-

(48) English

(a) Paradigmatic view

PRON		NUMBER	
		SG	PL
PERSON	1P	I	we
	2P	you	
	3P	M	he
		F	she
		N	it
			they

(b) Systemic view



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