

Abstraction, complementation, and long-distance *Wh*-movement(s)

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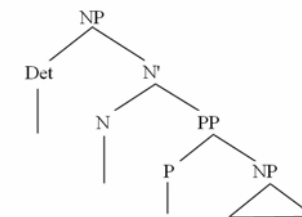
Usage and structure

- Usage events: concrete
- Structure: abstract
 - ‘Utterance X [a concrete usage event] has structure’ → two kinds of abstractions
 - 1 analysable into distinct elements that are also used in other utterances (cf. ‘words’)
 - 2 combined in a way that is also used in other utterances (cf. ‘rules’)
- Matter of principle (if not definition). But:
 - 1) Where to stop?
 - 2) By/For whom: Linguist? Language user?

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Usage and structure

- Question 1 (‘Where to stop’)
 - *an angel of a child, this bear of a man, a wheel of a truck, the top of a mountain, ...*
 - Words (and categories) and completely general rules of combination: all the same structure



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Usage and structure

- Question 1 (‘Where to stop’)
- But:
 - *a wheel of a truck, the crown of a king*
“a wheel that is part of a truck”, “the crown that belongs to a king”
 - *an angel of a child, this bear of a man*
“a child who is like an angel”, “this man who is like a bear”
‘Expressive binominal construction’, restricted paradigms, special relations
[DET[-the] - EXTREME VALUE - of a N¹]_{NP}

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Usage and structure

- Question 2 (‘By/For whom’)
- Consider:
 - scanner, printer, computer, freezer, propeller, ruler, ...*
- Analysability is not the same for all members of a speech community
 - without hindering communication!
 - factor in language change: increase in size of subpopulation for which an item is not analysable
 - entails: for some time, the same item does not have the same structure for all members
 - cf. Dutch *misschien* (‘maybe’) ← *mag geschieden* (‘may happen’)

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Usage and structure

- Notion of ‘the’ structure of an expression is in fact problematic in a number of ways
 - It is not clear a priori what the relevant units and their relations are, especially since they may be also be of an intermediate level of abstraction
 - It is not clear a priori that the same expression (i.e. phonetically and functionally the same) has a single structure (the same structure for all members of the speech community)

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Usage and structure

- Real issue: determine the proper level of abstraction
- Usage based approaches do not question *existence* of abstraction (thus structure)
 - not ‘even’ Thompson (pace Newmeyer?)

“Our findings suggest that speakers make use of a wide range of practices – some entirely pre-stored, others partially pre-stored and partially composed based on low-level formats, others not at all pre-stored – and this diversity must be acknowledged and described in our syntactic theories. Focusing too heavily on one practice – whether it is the pre-stored, monoclausal end or the entirely compositional end [-] misses the diversity that underlies the practices by which speakers use ORCs in conversation.” (Fox and Thompson 2007: 319).

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Usage and structure

- Importance: instantiation in linguistics of very general scientific ‘couple’ of reduction and emergence
 - higher level (emergent) phenomena to be explained in terms of more basic notions
 - physical properties of solids and fluids can be explained in terms of properties of single molecules and their interaction under certain specifiable conditions (reduction)
 - these properties are still novel, only existing at the higher level: no single molecule is solid or liquid (emergence)
 - they may even constrain (behavior of) elements at lower level

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Usage and structure

- Importance: instantiation in linguistics of very general scientific ‘couple’ of reduction and emergence
 - higher level (emergent) phenomena to be explained in terms of more primitive notions
 - other examples
 - chemistry – life – chemistry
 - cells – multicellular organisms – cells
 - several other kinds of biological evolution
 - (trade) economy – money – (trade) economy
 - closer to home: combinatorial phonology (design feature of duality of patterning)

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Structure from usage

From stretches of sound to combinatorial phonology
(Zuidema & De Boer 2009)

Actual utterances are not strings of isolated phonemes, they are *trajectories* through auditory/articulatory space

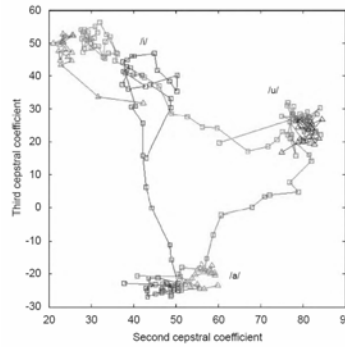


Fig. 2. Trajectory representations derived from recorded acoustic data from an American-English native speaker. Each point on a trajectory is given by the first two cepstral coefficients (Bogert, Healy, & Tukey, 1963) of the frequency spectrum of a short time interval of the signal.

Structure from usage

- *Trajectories* optimized for distinctiveness exhibit “*superficial* combinatoriality”
- *Using* it can give a benefit when sounds are learned (e.g. for production of novel signals)

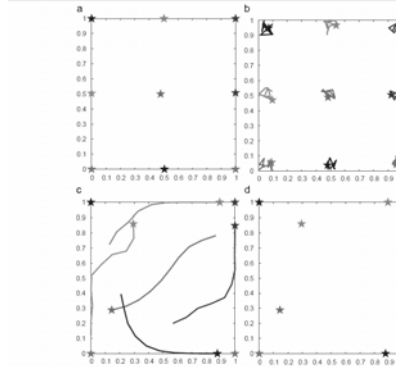
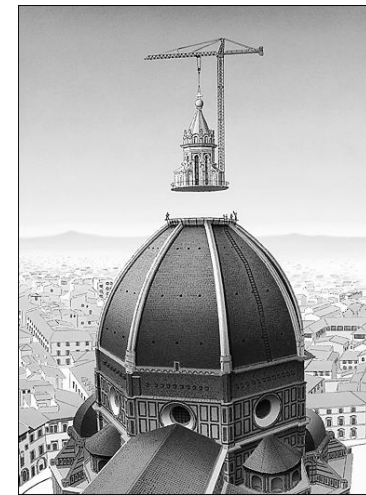


Fig. 3. In a combinatorial phonology, distinctiveness of signals at each particular time slice is sacrificed for better distinctiveness of the whole trajectory. Homonymous signal (or, respectively, homonymous trajectories) will be organized as patterns like (a) and not like (b) when optimized for distinctiveness. For non-homonymous trajectories, the same pattern, as in (c), is not stable, but will – after optimization – instead be organized like (d). Each individual time slice, as illustrated with the end-point in (a), is sub-optimal, but the whole trajectory experience is as a local optimum.

- Power: no special mechanisms needed to explain emergence of novel phenomena
 - all mechanisms are independently useful
- i.e. no “skyhooks” (Dennett)!



Structure from usage

	Skyhooks	vs. Cranes
- heat	caloric	energy content of compounds
- electromagnetic waves	ether	Einsteinian space
- life processes	life-force	biochemistry
- mind	spirit	connected neurons in brain

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Structure from usage

- Emerged structure produces novel phenomena
 - E.g. combinatorial phonology: → unbounded lexicon
- Distinguish between
 - ‘greedy reductionism’: no cranes, no truly novel properties
 - ‘good reductionism’: cranes, truly novel properties
- If latter not recognized: debates never end
 - either skyhooks, or denial of complexity

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Structure from usage

- Claim for domain of grammar: usage (vocal communication between humans) provides the more basic notions from which structure emerges
 - novel properties, possibly feed back

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Structure from usage

- Communication precedes language
 - phylogenetically
 - ontogenetically
- Plausible mechanisms (cranes)
 - psychologically
 - routinization, entrenchment
 - pattern recognition, abstraction
 - socially
 - imitation, coordination, conventionalization
 - pursuing communicative success: expressivity (novel situations, novel goals, competition)

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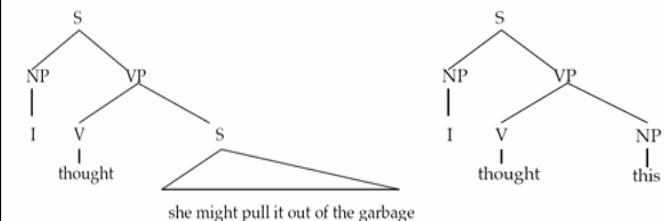
Abstraction

- If structure emerges by abstraction over usage events, then there is always the possibility (risk) of ‘overestimating’ the degree of abstraction
 - motivates criterion of ‘productive use’ in child language research
 - we only say the child has mastered passive (rule or construction) if it applies it (appropriately) to novel verbs not yet encountered in passive usage
 - should be applied equally to adult language use
 - recall *an angel of a child*, ...
 - cf. ‘superficial combinatoriality’ in phonology!

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Abstraction and complementation

- Suppose: some evidence for similarity between clausal complements and objects/arguments/constituents; hypothesis: they have the same structure



Abstraction and complementation

- then, without further qualifications:
 - anything that qualifies as an S or an NP can be complement of *I thought*
- and if this structural analysis is supposed to be independent of the content of matrix as well:
 - anything that qualifies as an S or an NP can be complement of a CTP
- Point: *distributional* similarities entailed by structural analysis (otherwise empty)

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Distributional analysis

- Basic *linguistic* methodology, in any approach
- Suppose: distributions not 100% identical
- Two possibilities:
 - 1) original hypothesis wrong: different structures
 - 2) some other factor is involved in one of the ‘exceptions’
- How to decide?
 - Especially since proponent of 1) might claim: factor proposed by proponent of 2) is a characteristic feature of the other structure

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Distributional analysis

- Basic *linguistic* methodology, in any approach
- Notice: agreement in principle (despite differences in outcome)
 - Thompson: argues against object status
 - Newmeyer: argues in favor of object status
- But: distributional analysis should be applied *strictly*, before general conclusions are drawn – and this is often forgotten

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Distributional analysis

- Example
 - Thompson: Complements are not objects, otherwise we should find them also as subjects of corresponding passives, and we do not:

??*That Peter Harder is a great linguist is agreed by everyone*
 - Newmeyer: Extraposed clausal subjects do occur in actual usage:

It is agreed by everyone that Peter Harder is a great linguist

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Distributional analysis

- But problem is: this *assumes* that these things are subjects. How about:
 - **It is agreed by everyone this (opinion)*
 - John and Mary are talking*
 - **It/They are agreed that Peter is a great linguist and that this is a wonderful symposium* (cf. *It is agreed that S₁ and S₂*)
- “Subjects cannot be extraposed and they have to agree in number with the verb”
 - *proves* that extraposed clauses are not subjects of passives (hence not objects of active verbs)
- Selectively choosing one kind of reasoning: “methodological opportunism” (Croft 2001)

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Distributional analysis

- Relation between categories and distribution:

(1a) <i>Jack is cold.</i>	(3a) * <i>Jack is dance.</i>
(1b) * <i>Jack colds.</i>	(3b) <i>Jack dances.</i>
(2a) <i>Jack is happy.</i>	(4a) * <i>Jack is sing.</i>
(2b) * <i>Jack happies.</i>	(4b) <i>Jack sings.</i>

	[Sbj <i>be</i> __]	[Sbj ___ -TNS.PERS]
Adj: <i>cold, happy, etc.</i>	✓	*
Verb: <i>sing, dance, etc.</i>	*	✓

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Distributional analysis

- Illustration: two ‘tests’ for Direct Object in English
 - (1) *Jack kissed Janet.*
 - (2) *Janet was kissed by Jack.*
 - (3) *The old man walked with a cane.*
 - (4) **A cane was walked (with) by the old man.*

	[Sbj Verb __]	[___Sbj <i>be</i> -PASS...]
Direct object: <i>Janet</i>	✓	✓
Oblique: <i>a cane</i>	*	*

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Distributional analysis

- Problem: the two ‘tests’ do not consistently make the same distinction (mismatch)
 - (1) *Jack weighs 160 pounds.*
 - (2) **160 pounds was weighed by Jack.*
- Usual strategy: pick one test as the ‘real’ test, in this case, the passive (i.e. *160 pounds* is not a direct object)
- But that doesn’t explain why *160 pounds* doesn’t need a preposition in the active clause
 - And what is being described is not something about a grammatical category “Direct Object”, but really something about the Passive construction

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Distributional analysis

- Problem: the two ‘tests’ do not consistently make the same distinction (mismatch)
 - (1) *Jack has 160 points.*
 - (2) **160 points were had by Jack.*
- Usual strategy here: pick active as the ‘real’ test (i.e. *160 points* is a direct object)
- Croft: “Methodological opportunism!”
 - Cf. “Is *since* a preposition taking different kinds of complements, or does it belong to three different categories?”

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Methodological opportunism

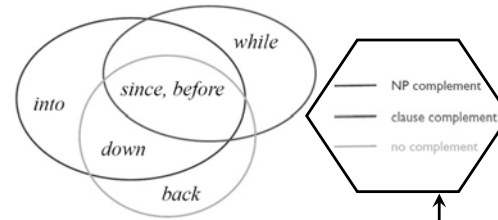
- (1a) *I haven't seen him **since** the party.* Preposition?
 (1b) *I haven't seen him **since** the party began.* Subordinator?
 (1c) *I haven't seen him **since**.* Adverb?

- (2a) **Joan is really **into** she flies in a balloon.*
 (2b) **Joan walked **into**.*
 (3a) **Randy looked **down** the bird looked up at him.*
 (3b) *Randy looked **down**.*
 (3c) *Randy walked **down** the hill.*
 (3a) *She slept **while** I ate lunch.*
 (3b) **She slept **while** my lunch.*
 (3c) *I ran **back**.*
 (3d) **I ran **back** my office.*

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Distributional analysis

- Genuine analysis:



- Neither 'lumping' nor 'splitting' justified
- No large classes with uniform behavior
- Any generalizations defined by constructions

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Distributional analysis

- Distribution patterns for words are *generally* mismatched
- which is to be expected when systematicity arises out of regularities in usage
 - typically local
 - emerging gradually, with accumulation of experience
- but linguists (as scientists) like generalizations and abstractions ('general laws', so to speak)
 - allow reduction (to some extent!)
- and hence often 'jump to abstractions' too hastily
- UB-framework also (especially) invites looking for generalizations in processes, not only structures

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Distributional analysis

- Clause as constituent of another clause. Why?
 - Parallel distribution

He knows	that it will be raining
	something
	it

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Distributional analysis

	<i>it/something</i>	<i>the book</i>	<i>that it will be raining</i>
read	X	X	X
think	X	–	X
realize	X	–	X
devour	X	X	–
see	X	X	X
paint	X	X	–
say	X	–	X
warn	–	–	X

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Distributional analysis

	<i>it/something</i>	<i>the book</i>	<i>that it will be raining</i>
read			X
think			X
realize			X
devour			–
see			X
paint			–
say			X
warn			X

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Distributional analysis

	<i>it/something</i>	<i>the book</i>	<i>that it will be raining</i>
read		X	
think		–	
realize		–	
devour		X	
see		X	
paint		X	
say		–	
warn		–	

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Distributional analysis

	<i>it/something</i>	<i>the book</i>	<i>that it will be raining</i>
read	X		
think	X		
realize	X		
devour	X		
see	X		
paint	X		
say	X		
warn	–		

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Complements as constituents

- Grammatical roles
 - The danger is that things will get out of hand.*
Subject, predicate?
 - (Cf. *It is a danger that things will get out of hand* vs. *The danger exists that things will get out of hand.*)
- He { *fears* / *is afraid* } *that things will get out of hand.*
Different analyses, miss generalization?

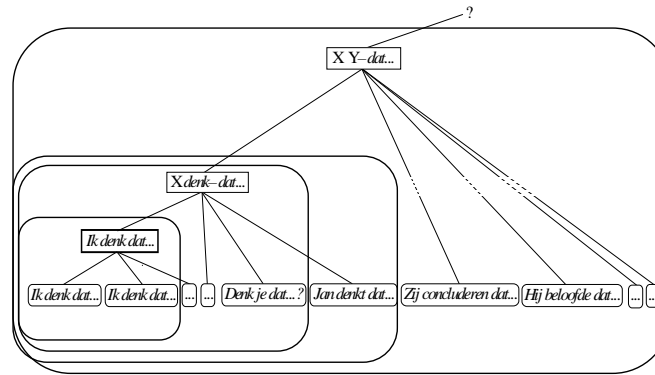
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Complements as constituents

- Opposite problem ‘on the functional side’
 - Some traditions in philosophy (Austin 1962) and linguistics (Benveniste 1958, Nuyts 2001)
 - Not all CTPs are really transitive sentences: first person, present tense is special
 - *I promise I’ll be on time.* (‘performative’)
 - *I think it’s raining.* (‘subjective’)
 - *He promised he would be on time.* (‘constative’)
 - *John thinks it’s raining.* (‘objective’)
- But then: Why structurally so similar?

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Abstraction and complementation



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Abstraction and complementation

- Type/token ratio’s
 - Conversation (52/425): 1:8.2
 - Newspapers (89/151): 1:1.7
- Productivity (definitely) in adults
 - in our societies: who have learned to read and write, and have considerable experience with texts, and the high type frequency of CTPs that is characteristic for it

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Abstraction and complementation

“I have already reported before that there has been success in breeding clones of mammalian embryo’s. From the above it may now be concluded that it will become possible in the near future to make new embryo’s with the DNA of full-grown animals as well. The director of GenTech even expects that this will already happen next year. Others believe that it may take somewhat longer, but nobody doubts that the cloning of a full-grown sheep or horse will be a reality within ten years.”

- Marking perspective (not just within speech situation)
 - not subordinate but rather ‘orthogonal’

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Discourse structure

‘Main’	‘Subordinate’
I have already reported before that	there has been success in breeding clones of mammalian embryo’s
From the above it may now be concluded that	it will become possible in the near future to make new embryo’s with the DNA of full-grown animals as well
The director of GenTech even expects that	this will already happen next year
Others believe that	it may take somewhat longer
But nobody doubts that	the cloning of a full-grown sheep or horse will be a reality within ten years

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Abstraction and complementation

- Taking grammatical structure seriously:
 - *I promise I’ll be on time.* (‘performative’?)
 - *He promised he would be on time.* (‘constative’?)
- grammatically similar, and argumentatively
 - *I promise I’ll be on time, so don’t worry.*
 - *He promised he would be on time, so don’t worry.*
- difference: defeasibility
 - *#I promise I’ll be on time, but I might forget.*
 - *He promised he would be on time, but he might forget.*

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Some ‘lower level’ cases

- *it*-less impersonal CTPs
 - Belangrijk is dat de commissie van start is gegaan.*
Important is that the committee from start is gone
“What’s important is that the committee got started.”
 - Feit is dat de kijkcijfers tegenvielen.*
Fact is that the ratings fell-short
“It’s a fact that the ratings were disappointing.”
 - Gunstig neveneffect is dat de corruptie afneemt.*
Favorable side-effect is that the corruption decreases
“A favorable side effect is that corruption decreases.”
 - Fact is that more and more photo’s [...] show up [...]*
Biggest problem is that there is no obvious organization that represents ...

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Some ‘lower level’ cases

- *Not that* Sentences (Delahunty 2006)
 - “Mr. Harriman?”
 - “Major,” he replied lightly. “*Not that it matters, old boy.*” (LeCarré 1962)
 - She hoped that perhaps Miss Robertson would give her a piece of ribbon. Not that she would wear it, but she’d like to show it to Norrie O’Dowd* (O’Brien 1942)
 - NTS addresses a possible inference from discourse so far and instructs to cancel it (and in the process evokes it)
 - Inherits features from general complementation construction, but is also a specific conventional device itself (‘encoding idiom’)

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Some ‘lower level’ cases

- More specific subconstructions, in different languages
 - Pity that you can’t go the party.*
 - Leuk dat je komt.*
Nice that you come
“I like it that you’re coming”
 - Dat je zoiets durft!*
That you such-something dare
“Amazing that you dare to do something like that!”

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And higher level?

- Newmeyer (this morning)
 - “Structure to be established independently from discourse function”
- “Complements are structurally subordinate”
 - (even higher level of abstraction!)
 - tests crucial for analysis of structure
 - E.g.: fact that 84% of complements of *think* lack complementizer in conversational usage is not decisive
 - (Well, what if there is a functional difference?)
 - No disagreement in principle (again), but: to be applied strictly and comprehensively

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And higher level?

- Newmeyer
 - Distributional tests like:
 - If you can insert *that*: subordinate
 - If clause alternates with nominal object: subordinate
 - Especially: grammatical phenomena restricted to subordination
 - *each other* as subject
 - *Each other went to the store together
 - uh.. joking that that each other are homosexual
 - mandative subjunctive
 - *Everyone take at least one dance class
 - I suggest that everyone take at least one dance class

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And higher level?

- But: risk of jumping to abstractions
 - insertion of *that*: at best diagnostic of complementation (generalising to “subordination” requires separate demonstration)
 - alternation with nominals: can go either way (*I promised her a book* vs. **I warned her a book*, and so on and on... “methodological opportunism”)
 - Subject role of *each other*: at best characteristic of complements (*that* required?)
 - ?*They knew if/laughed because each other were homosexual*
 - Mandative subjunctive: characteristic for specific subset (in fact imposes reading as directive speech act)
 - “Complementation is special”
 - Not the same as more abstract “subordination”!

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And long-distance Wh-movement?

- so what do you think that um we should do um as far as wwe’re standing right now with our position
- what do you think that the u..s. should do to prevent bio terrorism
- mhm well ah what do you think that they might not know because of ah technology that ah you may know ah
- so [mn] what do you think that september eleven has done to to your life

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And long-distance Wh-movement?

- so what do you think that um we should do um as far as wwe’re standing right now with our position
- what do you think that the u..s. should do to prevent bio terrorism
- mhm well ah what do you think that they might not know because of ah technology that ah you may know ah
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LD-Wh: English

Brown Corpus:

“Fools”, he bayed, “what do you think you are doing?”
What does he think a remark like this “lousy” one does to our prestige and morale?
What conclusions do you think he might come to?
What you think I care about that?
“I don’t know what you think you’ve been doing about my clothes”, he said.
What did she think he could do?
What do you think I did with them?
What the hell do you think baseball is? [twice]
What the hell do you think it’ll be like up there?
Who do you think pays the rent?
And what would you say he wants to do?

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LD-Wh: Dutch

Eindhoven Corpus:

Hoe denkt u dat de AKV-gedachten in de gemeenten zullen landen?
En wat denk je dat ie zei, die prins?
Wie denk je dat je voorhebt, om me zo te tekenen?
Waarom dacht je dat dit geslacht tot nu toe alleen maar vrouwen voortbracht? Voor de lol?
Wat denk je dat moeder en vader voor cadeau voor je hebben?

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LD-Wh: Dutch

- Other than *denk_+2nd* person?

de Volkskrant, 1995:

En wat zei je nou dat die Cornell had bereikt?
Hoe vind je dat Kok het in de laatste verkiezingen heeft gedaan?
Waar wil je dan dat ik het over heb?
Wat denken B en W dat onze burgers zullen denken van zo’n dure buitenlandse reis?
Hoe denkt Oudkerk dat dit in zijn werk is gegaan?
Hoe denken zij dat het voelt om als juist teruggekeerde militair te moeten lezen dat het zojuist meegemaakte niets voorstelde?

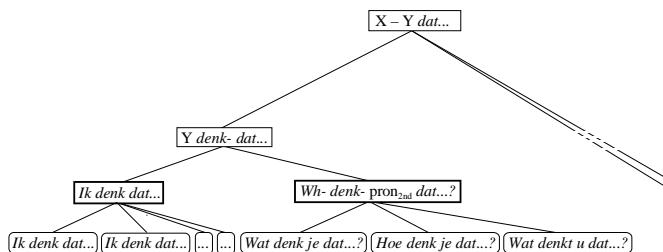
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CTP type/token ratio’s

- Complementation in general
 - Conversation (52/425): 1:8.2
 - Newspapers (89/151): 1:1.7
- ‘LD-Wh’
 - Newspapers (4/34): 1:8.5
 - Spoken Dutch (8/81): 1:10.1 (*think/others*: 59/81)

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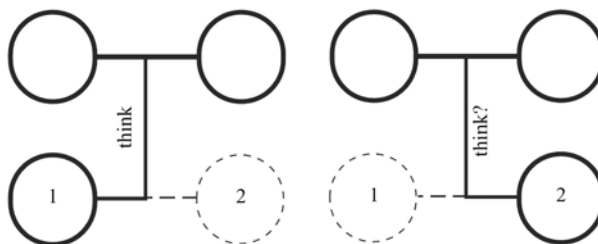
'LD-Wh' = low-level schema in complementation network



Dutch template: 'Wh-denk-2ndPerson-dat . . .'
English template: 'Wh-do-2ndPerson-think-S'

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'LD-Wh': put addressee's pov on stage



'I/X think . . .'

'Wh-do you/X think . . .'

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Entrenchment & acceptability

- Dąbrowska 2004:
 - First 'LD-Wh' at 4, before full command of complementation
- Acceptability rating (1-5)
 - prototypical LD-Wh-sentences: *Where do you think they sent the documents?* 5
 - non-prototypical LD-Wh-sentences: *Where will the customers remember they sent the documents?* 2.5

Difference highly significant.

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Entrenchment & acceptability

- Acceptability rating (1-5)
 - prototypical declarative sentences: *You think they sent the documents to the Head Office.*
 - non-prototypical LD-Wh-sentences: *The customers will remember they sent the documents to the Head Office.*

No significant difference.

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Entrenchment & acceptability

- Replication (+) in Dutch:
- Acceptability rating (1-5)
 - prototypical LD-Wh-sentences: *Waar denk je dat ze de documenten naartoe gestuurd hebben?*
 - non-prototypical LD-Wh-sentences: *Waar verklaren de klanten dat ze de documenten naartoe gestuurd hebben?*

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Entrenchment & acceptability

- Acceptability rating (1-5)
 - prototypical declarative sentences (2nd person): *Je denkt dat de op het schilderij afgebeelde personen mythische figuren zijn*
 - + prototypical declarative sentences (1st person): *Ik denk dat de op het schilderij afgebeelde personen mythische figuren zijn*
 - non-prototypical declarative sentences: *De kunstkenner concludeert dat de op het schilderij afgebeelde personen mythische figuren zijn*

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Entrenchment & acceptability

• Results

	N	Minimum	Maximum	Mean	Std. Deviation
PROTO_QU	10	4,30	5,00	4,6800	,26998
NOT_PRO_QU	10	2,10	4,30	2,8500	,67864
PROTO_DEC_2	10	2,90	5,00	4,4600	,63631
PROTO_DEC_1	10	4,00	5,00	4,6500	,35978
NOT_PRO_DEC	10	3,20	4,90	4,3300	,51001
UNGRAM	10	1,00	1,25	1,1000	,09461
Valid N (listwise)	10				

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Entrenchment & acceptability

• Prototypical vs. non-prototypical questions:

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
factor1	16,562	1	16,562	115,728	,000	,928
Error(factor1)	1,288	9	,143			

• 2nd person vs. 'non-prototypical' declaratives:

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
factor1	,084	1	,084	,367	,559	,039
Error(factor1)	2,071	9	,230			

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Entrenchment & acceptability

• 1st person vs. 'non-prototypical' declaratives:

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
factor1	,512	1	,512	9,640	,013	,517
Error(factor1)	,478	9	,053			

- Basis for acceptability judgment
 - not: derivable from general rules, for abstract structure
 - rather: similarity to templates, especially of (specific) exemplars

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Higher level, nevertheless?

- (1) Schippers & Hoeksema (in prep.)
 - *Wh*-movement involved in more constructions:
 - (1) *Wh*-movement
[_{CP} Who do you think [_{CP} John will kiss _{t_{who}}]]
 - (2) *Relativization*
[_{CP} That is the girl who I think [_{CP} John will kiss _{t_{who}}]]
 - (3) *Topicalization*
[_{CP} The girl I think [_{CP} John will kiss _{t_{the girl}}]]
 - (4) *Comparatives*
[_{CP} John has kissed more girls [_{CP} than OP I think Peter did _{t_{OP}}]]

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Higher level, nevertheless?

- Pattern type (1) confirmed
 - verbs: *denken* ('think') and *willen* ('want to')
 - (Note: latter absent in English)
 - subject: 2nd person
- Pattern types (2)–(4) different
 - verbs, e.g. *zeggen* ('say') and *weten* ('know')
 - subjects: more 1st and 3rd persons
- Begging the question...
 - 'Same' construction? Or 4 different ones, with overlapping (but not identical) properties?

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Higher level, nevertheless?

- Also: limitations of type (1) may be accounted for by pragmatic principles (interrogative speech act)
 - therefore not stored as property of template
- 'Non sequitur' – cf. 'rule-list fallacy'
- Nonetheless: interesting and relevant
 - details of network: nodes and connections
 - cf.: subjects of dependent questions more variation; correlates with variation in ('higher') perspectives
'k weet niet helemaal of klopt wat ik denk dat ik mis.
"I'm not sure if it's right what I think I'm missing"

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A functional alternative?

- (2) Ambridge en Goldberg (2008)

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A functional alternative?

- Degrees of unacceptability of LD-*Wh*
 - She said she had done x. / What did she say she had done?
She whispered that he had done x
??What did she whisper that he had done?
She knew that he had done x
??What did she know that he had done?
The trade union leader conceded afterwards that she had done x
*?What did the trade union leader concede afterwards that she had done?
She issued a statement that he had done x
*What did she issue a statement that he had done?
She left the movie 'cause they were doing x
*What did she leave the movie 'cause they were doing?
That they were doing x, bothered her
*What did that they were doing bother her?

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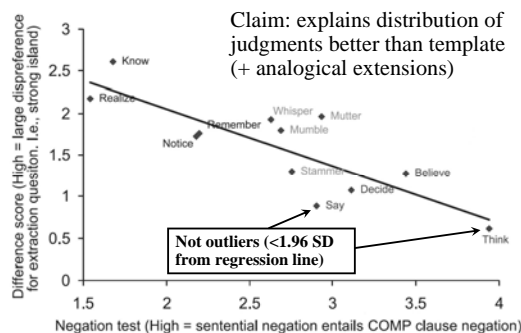
A functional alternative?

- Ambridge & Goldberg (2008), i.a.:
 - certain slots in certain constructions are construed as presupposed information
 - Cf. 'negation test', i.a.:
She didn't say that he left → he left
She didn't whisper that he left → he left
She didn't know that he left → he left
 - You can't ask a question about presupposed information
 - "It is pragmatically anomalous to treat an element as at once backgrounded and discourse-prominent"
 - BCI ("Backgrounded constituents are islands")

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A functional alternative?

- Ambridge & Goldberg (2008):



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A functional alternative?

- BCI hypothesis not complete
 - Scores for *think* and *say* included in computation of regression line
 - makes it very hard to reach outlier status (esp. with only 12 items).
 - Template includes a conventional meaning: might well entail/implicate (effect of) BCI
 - Languages differ
 - Not accounted for by BCI (general cognitive mechanism), expected with items (conventional)
 - Cf. English, verb not only factor: e.g. presence of *that* makes LDD-questions worse

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A functional alternative?

- Template, BCI hypotheses not incompatible
 - each compatible with usage data
 - neither invokes structural recursion
 - separate function for matrix-part
 - different 'strategies' may be involved in different situations/individuals
 - which one used in special judgment task?
 - individuals in a population may have produced different generalizations from linguistic experience, or a generalization may have different degrees of entrenchment in different individuals
- The jury is still out...

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Speculative outlook?

- What *is* the status of
Who did Mary say that John kissed t ?
Who did Mary hope [_S that Tom would tell Bill
[_S that he should visit t]] ?
(Chomsky 1977)
- Only a syntactician's fiction, or can it still be taken as evidence for something real?
- Yes, it can; though not for syntactic *structure*, but for *process* of abstraction
 - See also Dąbrowska (2008), *CL*
 - And recall starting point: clauses as arguments

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Abstraction and recursion

- Proper understanding of complementation directly linked to evolutionary issues
 - Re: Recursion
 - “There is no longest sentence (any candidate sentence can be trumped by, for example, embedding it in “Mary thinks that ...”), and there is no non-arbitrary upper bound to sentence length. [...]
 - At a minimum, then, FLN includes the capacity of recursion.” (Hauser, Chomsky & Fitch, *Science* 2002)
 - Crucial implicit assumption (←Zuidema)

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Abstraction and recursion

- Recursion involves a presupposition of identity
 - Rule applied to its own output
 - Procedure called during execution of the same procedure
 - Phrase embedded in phrase of the same type
- John believes that the lunar landing was staged*
- finite event description embedded in perspectival operator [no recursion!]
 - clause embedded in clause [recursion!]

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Abstraction and recursion

- In order for recursion to emerge, one has to see only a few, general, common features, i.e. to *abstract* from (many) specifics
 - *Ld-Wh*: finite event description in question-frame putting addressee on stage [no recursion], or clause in clause [recursion]

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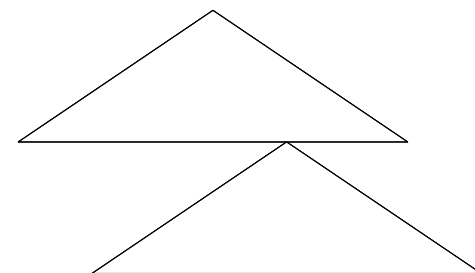
Abstraction and recursion

- Abstraction producing the possibility of productive recursive patterns does happen
 - witness complementation (in literate societies?)
 - and relative clauses, locational phrases, ...
- But it does not happen automatically
- And it will often be a matter of degree
 - with increasing experience of similarities in linguistic environments, categories may move closer to each other in grammatical space

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Abstraction and recursion

- From [_A ... [_B ...] ...] to [_X ... [_X ...] ...]



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Abstraction and recursion

- Emergent character does not mean that it has no interesting additional properties, not present in ‘earlier’ usage
 - enhance cognition and/or communication
 - and allow further applications, i.e. it becomes a crane à la Dennett
 - cf. place value system of numbers and invention of zero:
 - gradually evolved culturally
 - once in place, it not only made arithmetic simpler and more reliable, but also triggered a more abstract number concept (negative numbers, etc.)

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To conclude, ...

- Structure and usage are phenomena of different kinds and different levels
 - usage: processes, basic
 - structure: systems, higher (feeding back into usage, over time)
 - That should already keep us from treating them as opposites, and from both skyhooks and greedy reductionism
- reduction+emergence+feedback (‘good reductionism’) offers better perspectives
- Work in this framework has scarcely begun

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