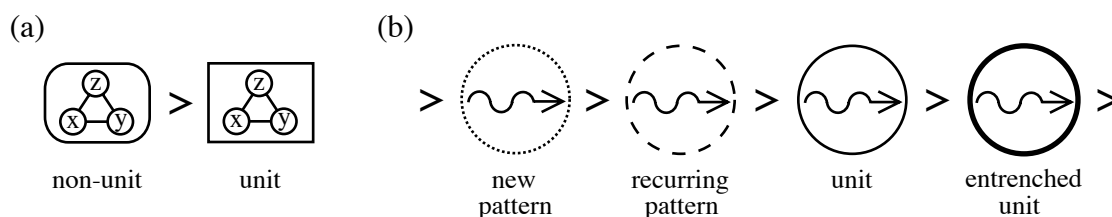


## Lecture 4 Dynamicity

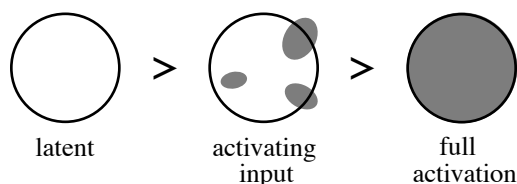
- A. Structure as Activity
- B. Sequence and Summation
- C. Paths of Access
- D. Reference Point Phenomena

### A. Structure as Activity

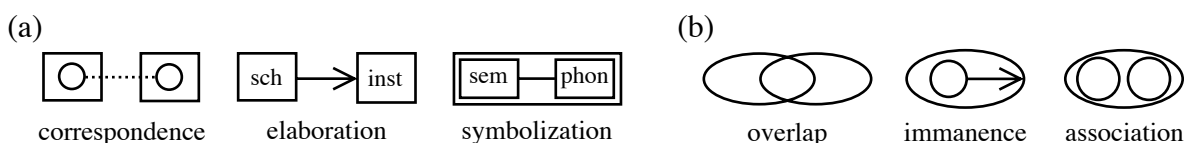
- (1)(a) Language is **dynamic**, consisting in *processing activity* (something that *happens*).  
 (b) As a cognitive phenomenon, it can be viewed at either the **neural** or the **psychological** level. Having a particular mental experience consists in a certain pattern of neural activity.  
 (c) A linguistic **unit** is an established pattern of activity: a *processing routine* evoked and executed as a pre-packaged whole.
- (2) A unit emerges by the *reinforcement* of recurring neural activity: *co-activation* (“firing together”) strengthens the *connections* between neurons, making it easier for the same pattern of activation to occur again. Eventually it becomes an established routine.



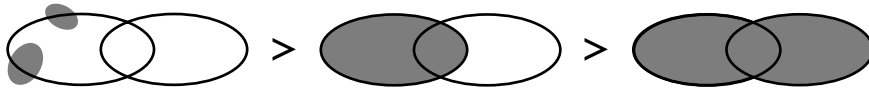
- (3) A well-entrenched unit is “an event waiting to happen” (an *attractor*). Once “unleashed” by activating input, its execution is automatic if not overridden by other input.



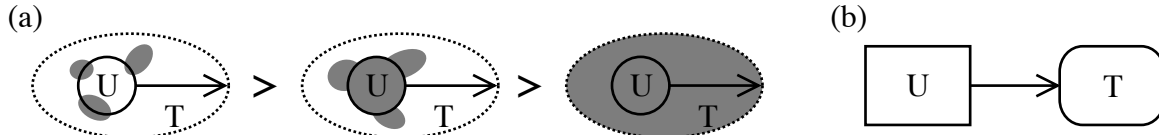
- (4) Units *overlap* to the extent that they consist in shared patterns of activity. As a special case, a schema is fully included in its instantiations. Structures that are merely *associated* (each able to activate the other) constitute a more complex structure including them both.



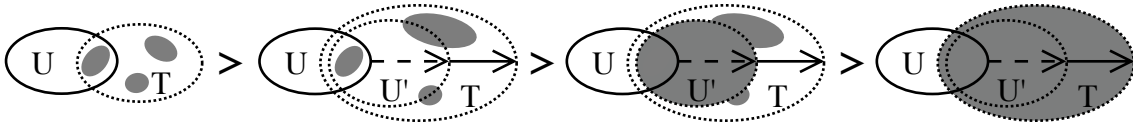
- (5) Activation *spreads* through neural connections, based on their strength. Due to (3), the activation of a unit tends to activate (or suppress) another that overlaps with it.



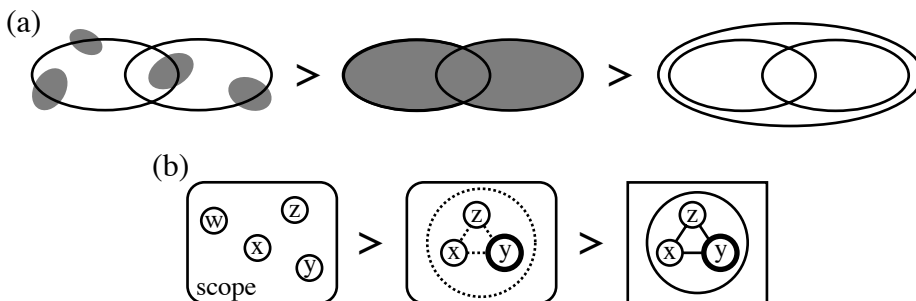
- (6) In *categorization*, input from the target (T) activates (“unleashes”) a categorizing unit (U), whose execution serves to structure T (“capture”). T is *apprehended as* an instance of U.



- (7) Overlapping structures *adapt* to one another when co-activated. E.g. T’s *apprehension as* U is not equivalent to its independent occurrence. U adapts to T when there is some conflict in their specifications; the adapted version, U', is recognized in T.

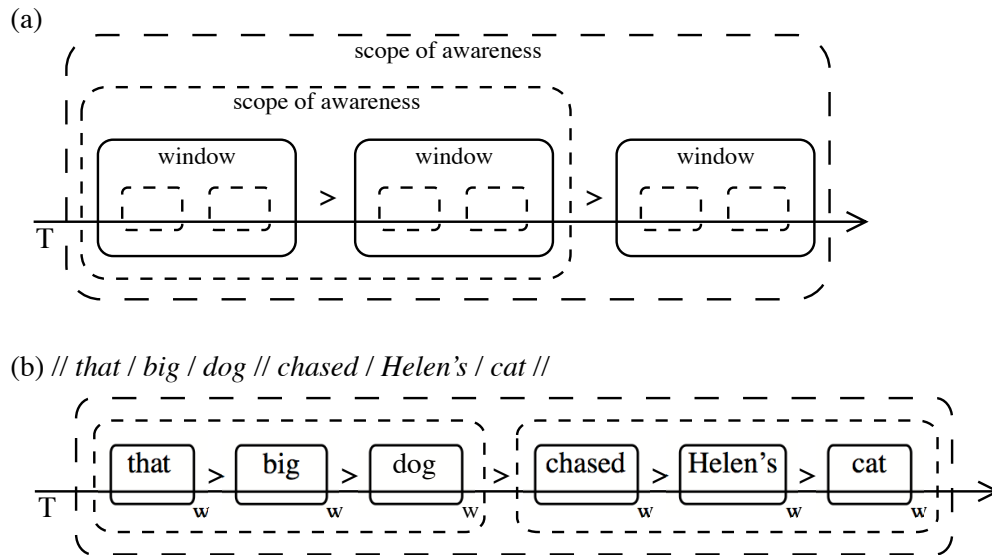


- (8) Due to (2), co-activated units (whether they overlap or not) tend to become associated, thus *combining* to form a larger structure that includes them both. Due to (7), the larger structure has *emergent properties* (e.g. a salient *focus* within the whole).

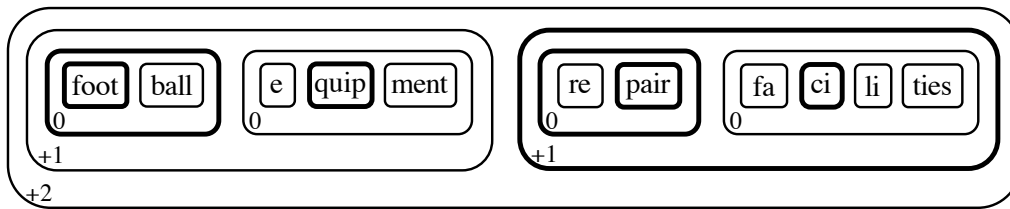


- (9)(a) To be connected, entities must appear within some **scope of awareness** (or **processing window**). In the temporal dimension, the scope (or window) is a *span of time*.  
 (b) Processing runs concurrently on different **time scales**, with windows of different duration.  
 (c) The structure in a window generally has a **focus**: an especially salient substructure.  
 (d) We are more aware of the structures appearing on certain time scales than on others.  
 (e) The terms *window* (or *window of attention*) vs. *scope of awareness* can be used reflect this difference in cognitive salience and accessibility (which is however only relative).  
 (f) *Helen* loves *her* cat. It is black with white spots. It has a fluffy tail. Sometimes it chases mice, but most of the time it sleeps. *She* feeds it tuna.

(10)



(11)



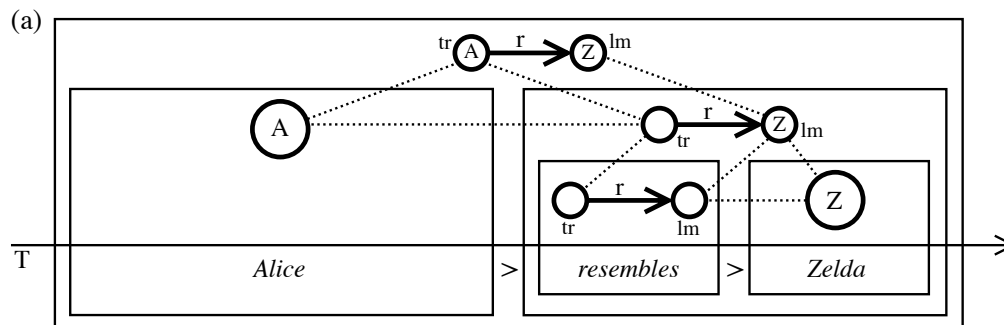
(12)(a) Processing in successive windows represents **serial** organization. **Hierarchy** emerges as elements appearing in separate windows, on one time scale, form a structure that appears in a single window on a larger time scale.

(b) A special case of hierarchy is grammatical **constituency**, which in CG is seen as variable and non-essential. Focusing at the semantic pole consists in *profiling*.

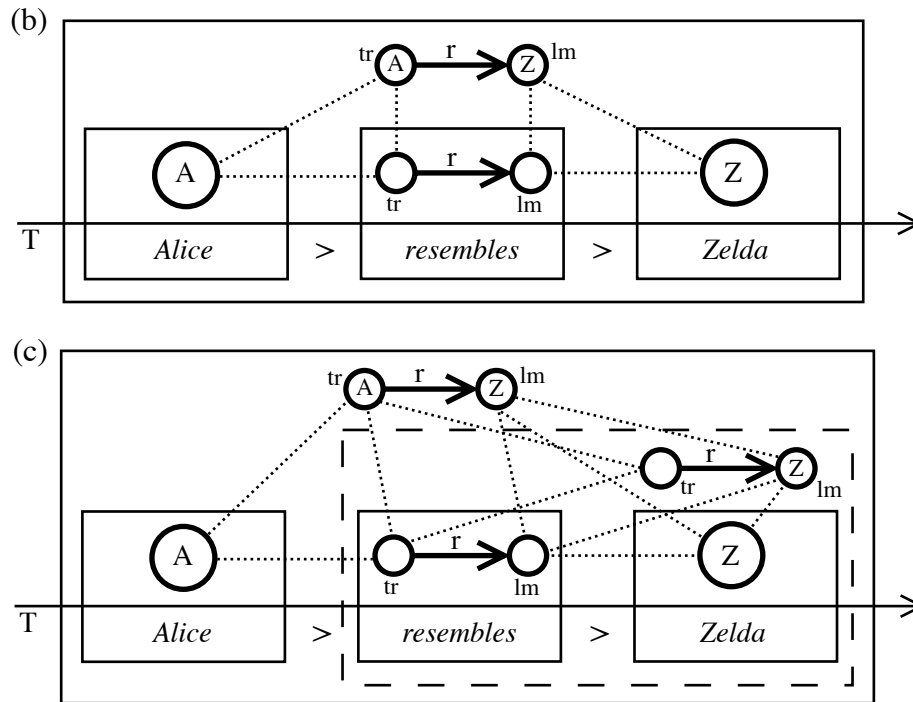
(c) The same content can be **packaged** in processing windows in alternate ways. A structure not evident in a single window—as indicated by prosodic grouping—may still emerge in a non-prosodic window on a larger time scale, symbolized only by adjacency (if at all).

(d) Symbolic assemblies allow the co-existence of groupings based on different considerations. Hierarchy is only one aspect of their organization.

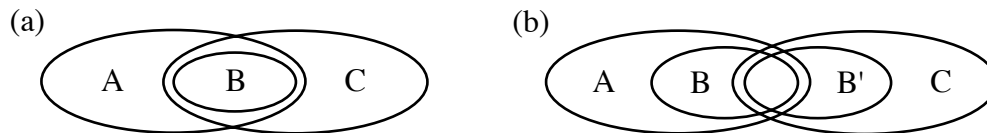
(13)



(13)



(14) The **coincidence** of structures established for independent purposes enhances processing efficiency. *unfaithful* [un-faith-ful] > *potatoes* [potato-es] vs. [po-ta-toes]



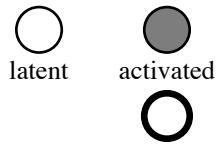
## B. Sequence and Summation

- (15)(a) The term **dynamicity** indicates **activity**, which always takes place through **time**. A situation is **static** when there is no activity. Stasis through time is **stability**.
- (b) The world as we experience it is generally organized in terms of **local activity** occurring in a global, more stable **frame of reference** (local vs. global being a relative matter).
- (c) While we conceive of both static situations and dynamic occurrences, **conception** is always *dynamic*, consisting in *processing activity*.
- (d) The relation between **conceived time** (t) and **processing time** (T) is thus a key to understanding linguistic structure.

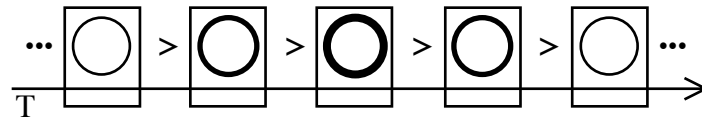


(16)

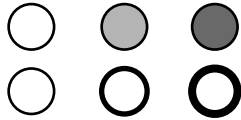
(a) Activation



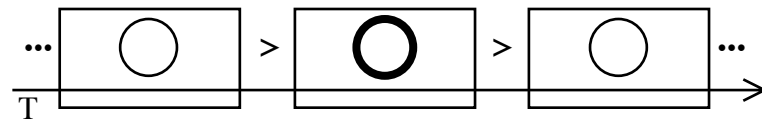
(c) Time course of activation (small time scale)



(b) Levels of activation

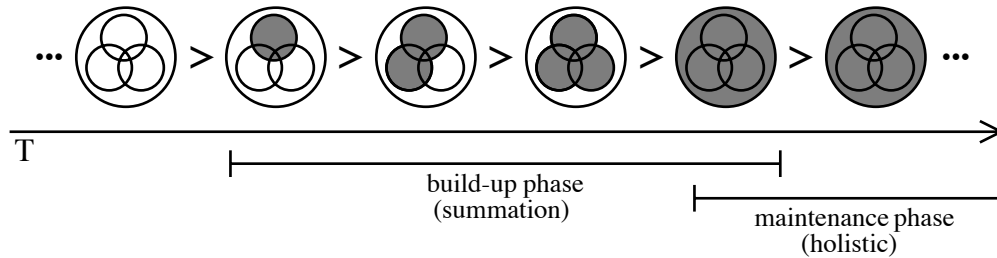


(d) Time course of activation (large time scale)

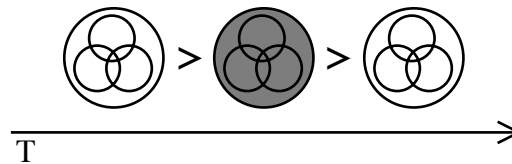


(17) Simultaneous activation (e.g. the articulation of [ā])

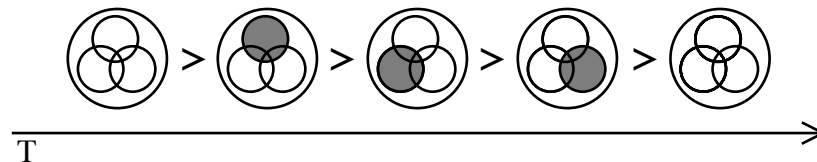
(a) Fine-grained view (small time scale)



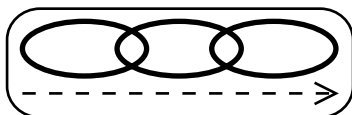
(b) Coarse-grained view (large time scale)

(18) Sequential activation (e.g. the articulation of [pin]), defining a **path of mental access**

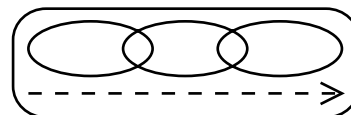
(a) Exploded view



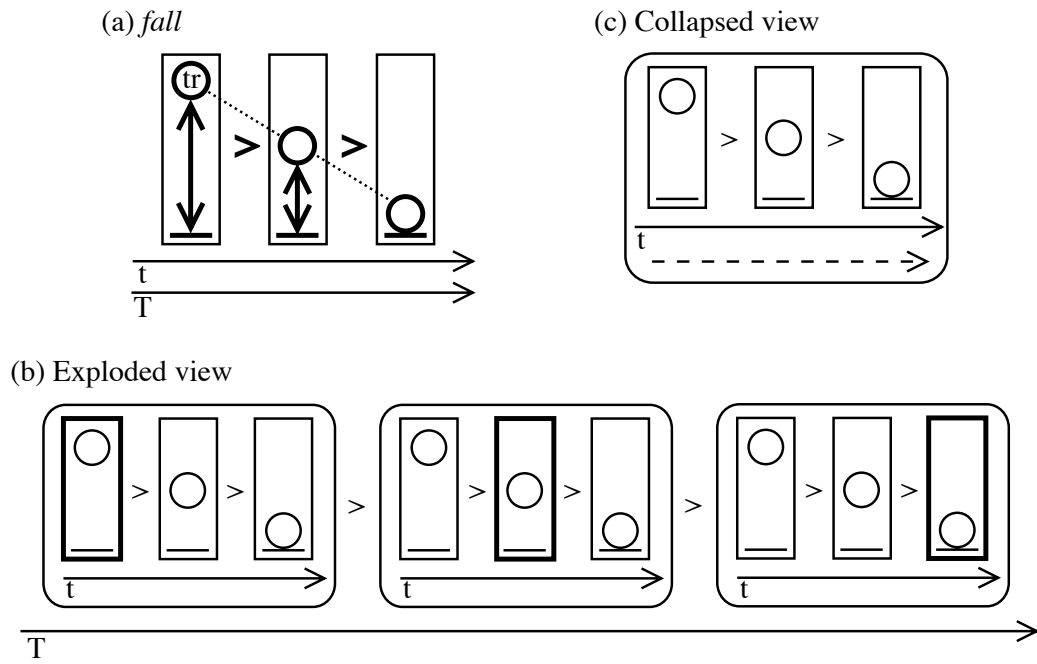
(b) Collapsed view (showing activation)



(c) Collapsed view (activation implicit)

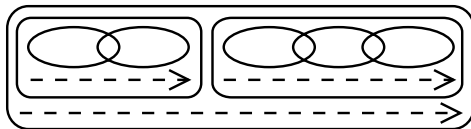


## (19) Sequential scanning of an event

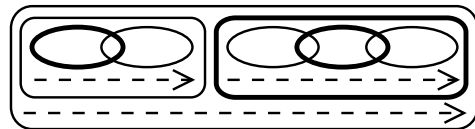


## (20)

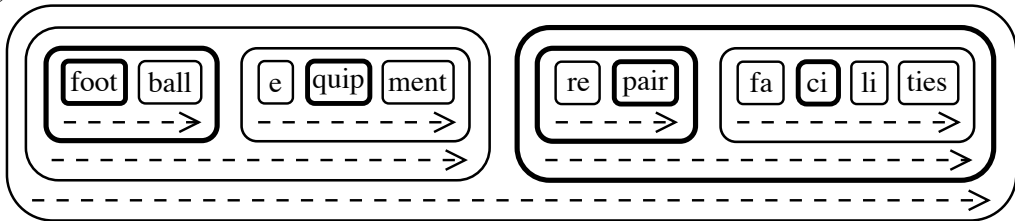
## (a) Levels of organization



## (b) Focusing (differential salience)

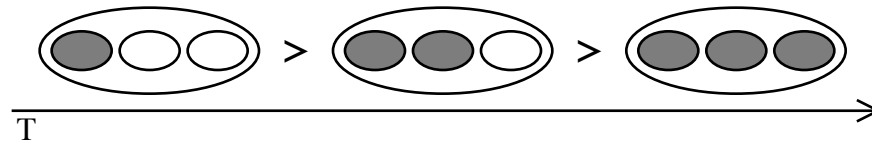


## (c)

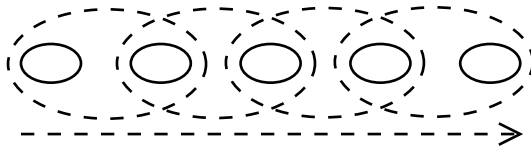


(21)

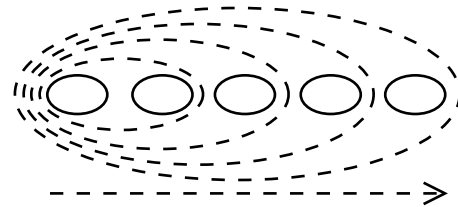
(a) Summation of sequentially accessed structure



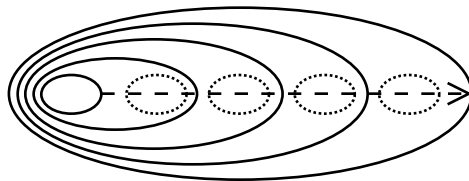
(b) Transient structures comprising adjacent elements



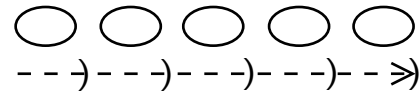
(c) Transient structures comprising all accessed elements



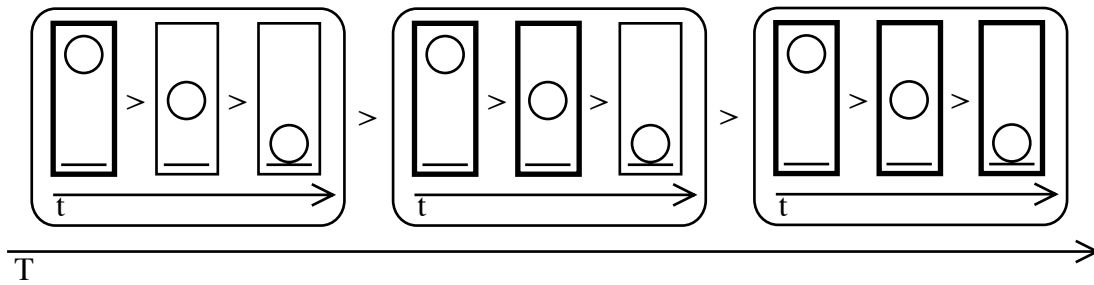
(d) Summation (exploded view)



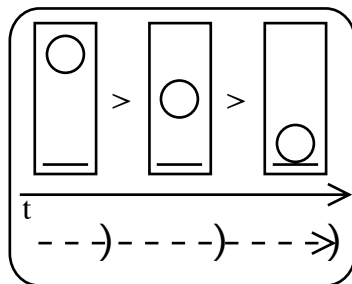
(e) Summation (collapsed view)

(22) *to fall*

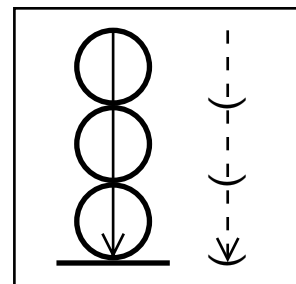
(a) Exploded view



(b) Collapsed view

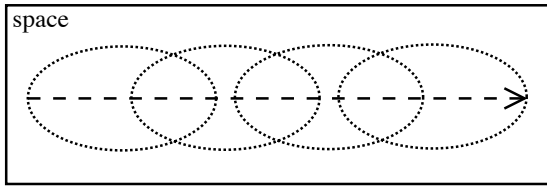


(c) Holistic conception

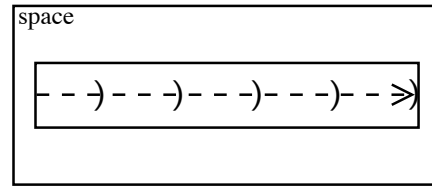
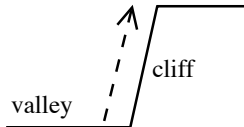
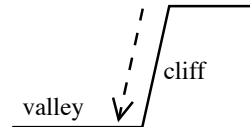
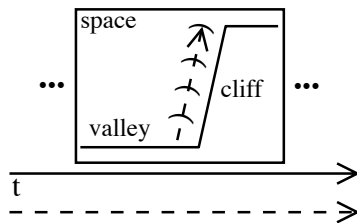
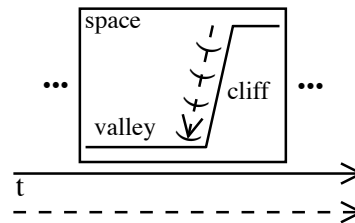


(23)

(a) Sequential scanning through space



(b) Summary scanning of elongated object

(c) *The cliff rises steeply from the valley.*(d) *The cliff falls steeply to the valley.*(e) *The cliff rises steeply from the valley.*(f) *The cliff falls steeply to the valley.*

### C. Paths of Access

(24)(a) The **time course** of conception—how it unfolds through processing time—is always significant, even for the apprehension of static situations.

(b) Any conception of **ordering** or **directionality** consists of *sequenced processing activity* at some level of organization (perhaps on a very small time scale).

(c) There are many **natural paths** of mental access. We tend to follow them, as it makes for processing efficiency.

(d) Paths correlated with time (t): (i) the component situations comprising an event; (ii) a path of motion through space; (iii) paths defined by causation or transmission of force.

(e) Other paths: (i) a chain of associations (e.g. those constituting a kinship relation); (ii) a series of whole-part relations (body > leg > foot > toe); (iii) a path based on specificity (thing > object > tool > hammer); (iv) an ordering based on magnitude (1 > 2 > 3 > ...).

(25)(a) **Order of presentation** is a path of access (in T) established by linguistic convention.

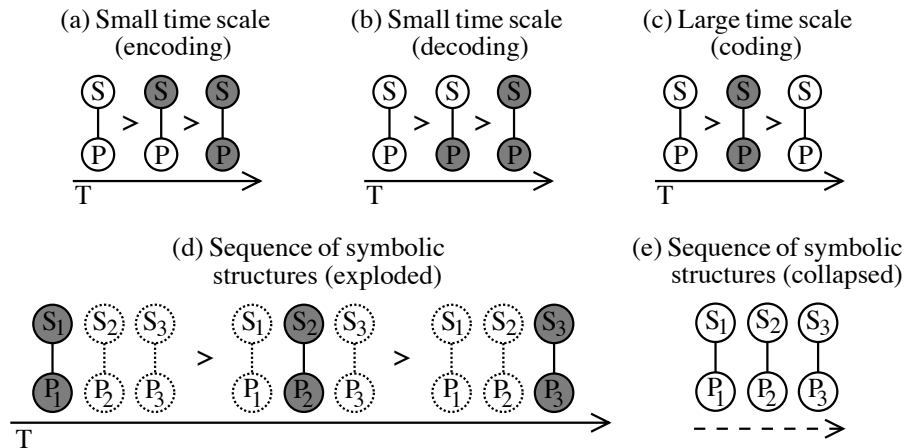
(b) In regard to language, processing time functions as both **speech time** (a basic dimension of phonological structure) and **conception time** (for the apprehension of meanings).

(c) **Symbolization** establishes a correlation between speech time and conception time: a symbolic structure's semantic and phonological poles (S and P) activate one another.

(d) On a small time scale the access may be sequential ( $S > P$  or  $P > S$ ), summation resulting in their simultaneous activation (holistic apprehension of the bipolar structure).

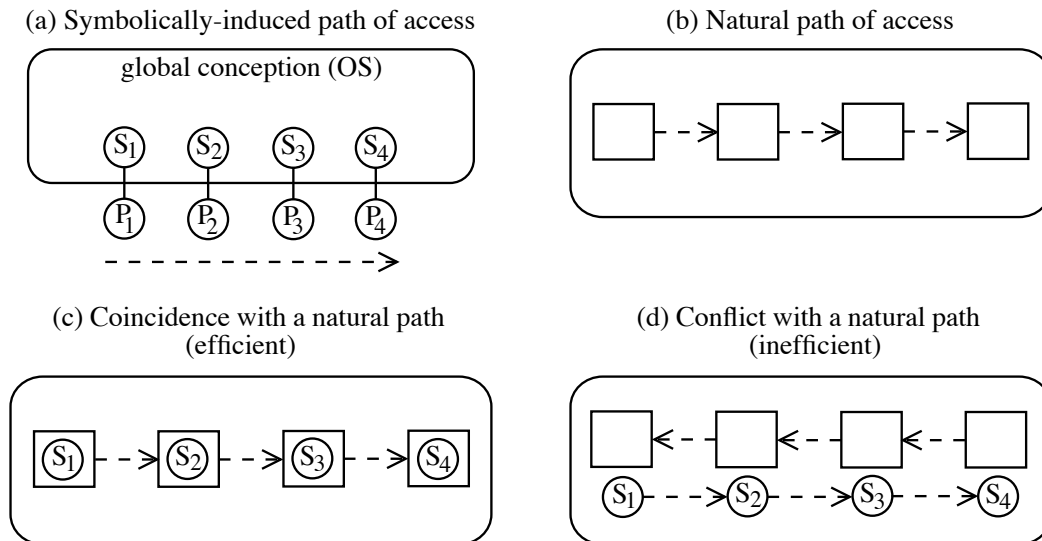
(e) Viewed on a larger time scale, S and P are accessed simultaneously (occurring in the same processing window).

## (26) Activation of symbolic structures



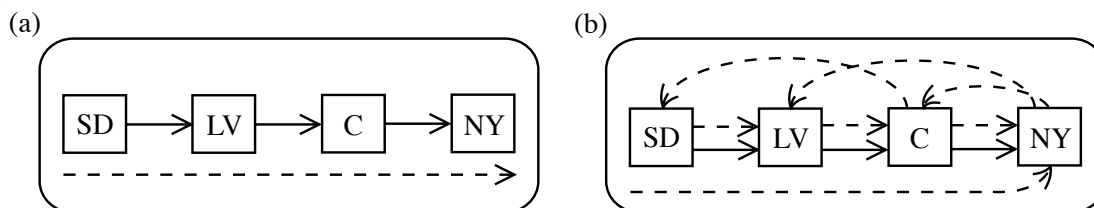
- (27)(a) Viewed as wholes, *symbols occur sequentially* on a given time scale: we process a series of words (or phrases, clauses, sentences) one at a time, each active in its own window.
- (b) In either speaking or listening, the order of presentation defines a **symbolically-induced path of access** to the overall conception being described (the objective scene).
- (c) Processing is more efficient when a *symbolic* path of access coincides with a *natural* one.
- (d) If they conflict, the same conceptual structures may have to be scanned more than once: for basic apprehension and for linguistic purposes.

## (28)



- (29)(a) *Alice quit her job. Then she got married. Then she had three children.* [iconic]
- (b) *Alice had three children. Before that, she got married. Before that, she quit her job.*
- (c) *Alice quit her job. She got married. She had three children.* [inferred order]
- (30)(a) *He drove from San Diego, to Las Vegas, to Chicago, to New York.* [iconic]
- (b) *He drove to New York (?from Chicago (\*from Las Vegas (\*\*from San Diego))).*
- (c) *\*He drove to Chicago from San Diego to New York to Las Vegas.* [random order]

(31)

(32)(a) *my wife's cousin's friend's doctor*

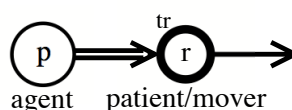
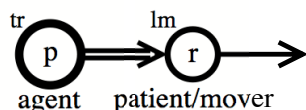
[iconic; natural point of access]

(b) *?the doctor of a friend of a cousin of my wife*

[iconic; less accessible starting point]

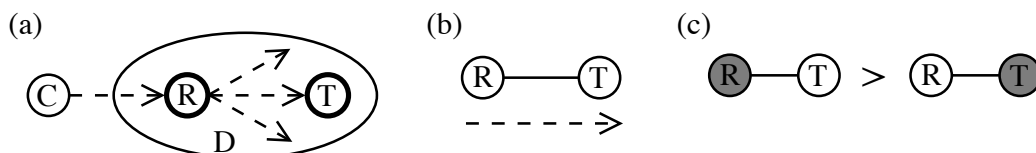
(c) *?\*the doctor of a friend of a cousin of the wife of me*(d) *?the doctor of a friend of a cousin of the wife of the mayor*(33)(a) Iconicity is a factor in **basic word order** within a clause: in most languages, *subject* precedes *object* in the default ordering; actives are neutral, passives are less typical.(b) Paths that tend to co-align: word order (in T); force ( $\Rightarrow$ ); sequence of subevents (in t); sequence of participant involvement (agent > patient); participant prominence (tr > lm).

(34)

(a) *A protestor threw a rock.*(b) *A rock was thrown by a protestor.*(35)(a)(i) *Zhāngsān dào túshūguǎn ná shū.* (ii) *Zhāngsān ná shū dào túshūguǎn.*(b)(i) *Tā cóng Zhōngguó lái.*(ii) *\*Tā lái cóng Zhōngguó.*(c)(i) *Tā zuótiān dào Měiguó lái.*(ii) *Tā zuótiān lái dào Měiguó.*

## D. Reference Point Phenomena

(36) In a *reference point relationship*, a conceptualizer (C) invokes one conceived entity—the **reference point** (R)—in order to *mentally access* another, the **target** (T). This *sequence of access* reflects an asymmetry, whereby R is more *salient* or *accessible* than T. R's **dominion** (D) is the set of potential targets (*associated entities accessible through it*).



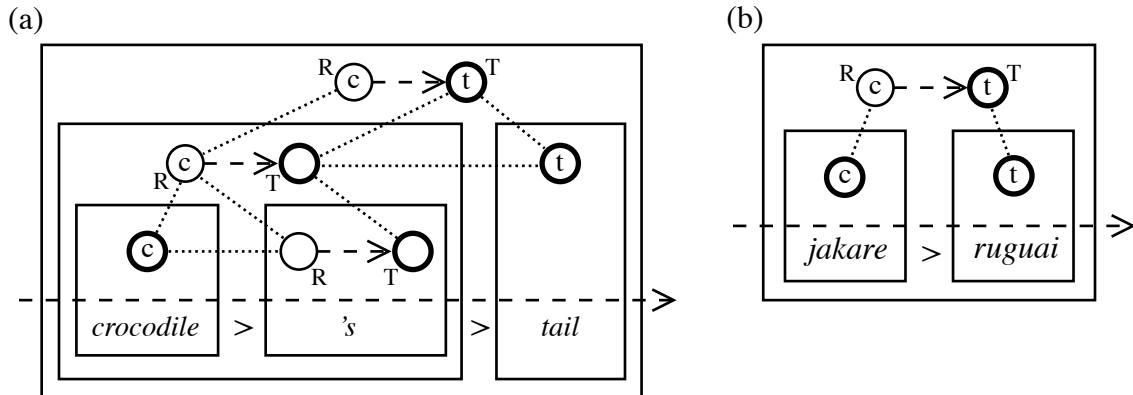
(37)(a) Possessive **prototypes** include *ownership*, *kinship*, and *whole-part* relations: *my watch*, *the boy's dog*, *Sally's house*; *his wife*, *your uncle*; *her head*, *the dog's tail*, *the tree's roots*

(b) However, possessives can be based on virtually any kind of **association**: *my train*, *your office*, *the cat's fleas*, *our nation*, *the boy's school*, *California's climate*, *the woman's anxiety*, *his punishment*, *my candidate*, *every parent's nightmare*, *an elephant's average weight*, *the battle's outcome*, *Lincoln's assassination*, *Booth's assassination* ...

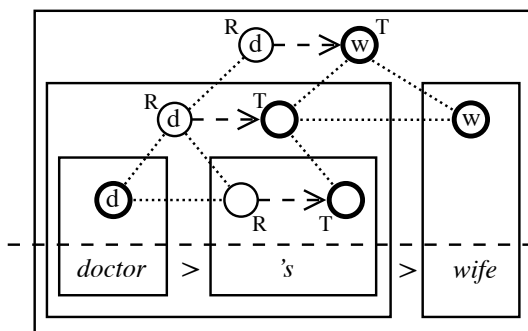
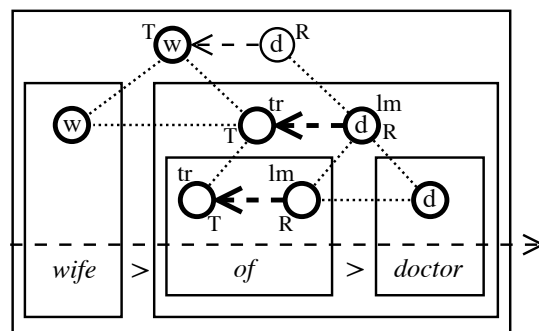
- (c) A possessive *schema* cannot be based on mere association, since possessive relations are usually **asymmetrical**: \**the tail's dog*, \**the school's boy*, \**the candidate's me*, \**the average weight's elephant*, \**the outcome's battle*, \**the assassination's Lincoln*
- (d) Because a reference point relationship has no intrinsic conceptual content—being just an **asymmetrical association** (path of access)—it can be the possessive schema.

- (38)(a) Possessives are **grounding** constructions, with the *intersubjective* function of *coordinating mental reference*: the speaker and hearer momentarily direct attention to the same entity (a thing) out of all those we are capable of conceiving.
- (b) Once R is specified, T is taken as being accessible for both interlocutors based on the **shared conceptual substrate**: what they are both presumed to know and be aware of in the current discourse context.
- (c) Possessives are based on relationships in the situation being described (OS), but their primary import is **subjective** and **non-descriptive**, residing in sequenced mental access.
- (d) Having little descriptive content, possessive markings have little phonological substance (e.g. English 's, Chinese *de*). Instead of segmental content, possession is often indicated (iconically) merely by adjacency of R and T in the speech stream.
- (e) Guaraní: *jakare ruguai* (crocodile tail) 'the crocodile's tail'

(39)



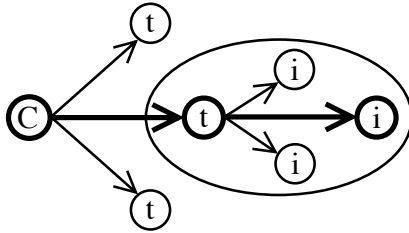
(40)

(a) *the doctor's wife*(b) *the wife of the doctor*

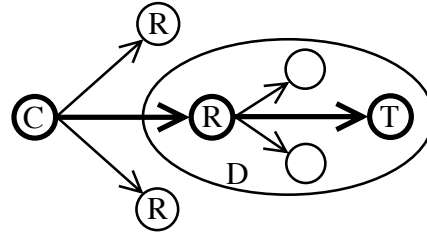
- (41)(a) With either order of presentation, the **target** is the *intended referent* of the overall nominal expression: the thing (out of all those we are capable of conceiving) that the interlocutors are trying to “reach” by establishing it as the joint focus of attention.
- (b) This target is the **profile** of the full expression. In processing terms, the profile is **focused** (highly activated) in the window where the nominal structure appears.
- (c) While R and T are accessed sequentially (in successive windows) on a smaller time scale, the entire structure is simultaneously active—and the target focused—in the window containing the nominal on a larger time scale.
- (d) With either symbolic order, T is accessed via two mental paths which together represent one **strategy** for fulfilling a nominal’s referential function: they pertain to the specification of a **type** and the **identification** of an instance of that type.

(42) Conceptual substrate for possessives

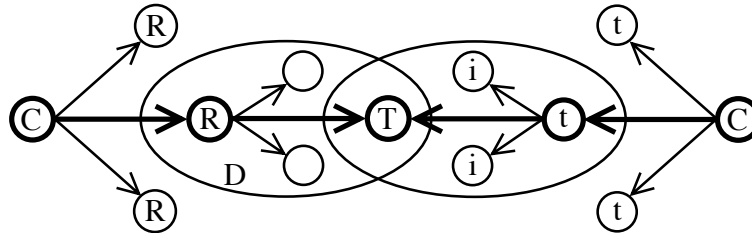
(a) Access path based on type specification



(b) Access path based on identification via reference point

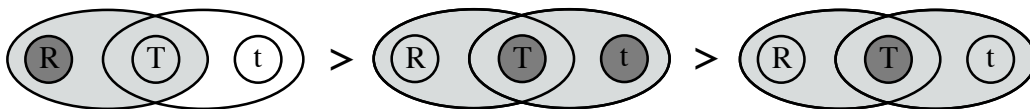


(c) Access to identified instance of type

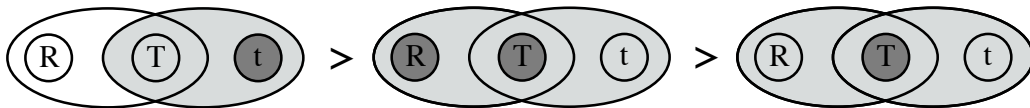


(43) Symbolic access for possessives

(a) Anchored by reference point



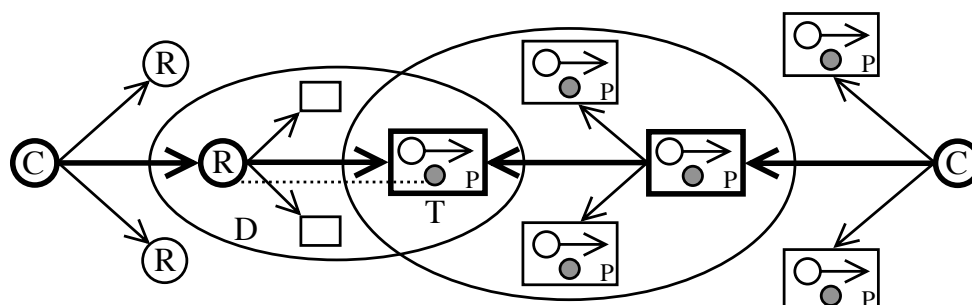
(b) Anchored by target



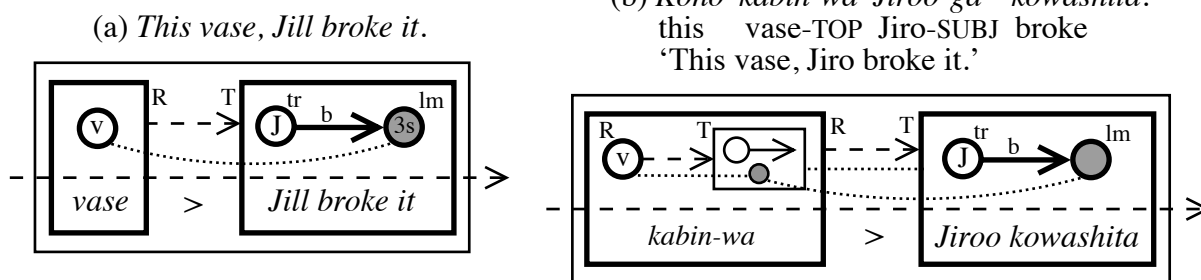


- (44)(a) **Topic** constructions are like possessives except that the target is not a *thing* but a *proposition* (P): the description of an event or situation (expressed by a clause).
- (b) Like possessives, a topic relation has little descriptive content. Consisting in sequence of mental access, it is often indicated (iconically) just by R directly preceding T.
- (c) In both cases, R is a nominal referent whose identification provides the basis for identifying T—determining its place in the interlocutors' mental world.
- (d) In both cases T requires identification because it is schematic in a crucial respect: with possessives, T simply specifies a type (not an instance); with topics, T is schematic in regard to one of its elements (an "open" proposition).
- (e) In both cases, R is readily accessible and anchors an array of known or presumed relationships (D). T is identified as having a place in R's dominion.

(45)



(46)



- (47)(a) In nominal compounds of the form  $N_1 + N_2$ , the normal pattern is for  $N_1$  (R) to specify a domain of knowledge (D) in which  $N_2$  (T) is to be interpreted.
- (b) *police dog, table top, field mouse, bird watcher, golf club, computer screen, thigh bone, baseball glove, water mill, book cover, window pane, wine glass, milk bottle, ski lift, skin cancer, candy store, fishing boat, fishing net, basketball net, hair net, butterfly net ...*

## References

- Chafe, Wallace. 1987. Cognitive Constraints on Information Flow. In Russell S. Tomlin (ed.), *Coherence and Grounding in Discourse*, 21-51. Amsterdam and Philadelphia: John Benjamins. Typological Studies in Language 11.
- , 1994. *Discourse, Consciousness, and Time: The Flow and Displacement of Conscious Experience in Speaking and Writing*. Chicago and London: University of Chicago Press.
- Croft, William. 2012. *Verbs: Aspect and Causal Structure*. Oxford: Oxford University Press.
- Deane, Paul. 1987. English Possessives, Topicality, and the Silverstein Hierarchy. *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* 13.65-76.
- Elman, Jeffrey L. 1990. Finding Structure in Time. *Cognitive Science* 14.179-211.
- Feldman, Jerome A. 2006. *From Molecule to Metaphor: A Neural Theory of Language*. Cambridge, MA and London: MIT Press/Bradford.
- Hebb, D. O. 1961. *The Organization of Behavior: A Neuropsychological Theory*. New York: John Wiley & Sons. Science Editions.
- Kumashiro, Toshiyuki. 2000. *The Conceptual Basis of Grammar: A Cognitive Approach to Japanese Clausal Structure*. San Diego: University of California doctoral dissertation.
- Langacker, Ronald W. 1986. Abstract Motion. *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* 12.455-471.
- , 1997. Constituency, Dependency, and Conceptual Grouping. *Cognitive Linguistics* 8.1-32.
- , 1999. *Grammar and Conceptualization*. Berlin and New York: Mouton de Gruyter. Cognitive Linguistics Research 14.
- , 2001a. Discourse in Cognitive Grammar. *Cognitive Linguistics* 12.143-188.
- , 2001b. Topic, Subject, and Possessor. In Hanne Gram Simonsen and Rolf Theil Endresen (eds.), *A Cognitive Approach to the Verb: Morphological and Constructional Perspectives*, 11-48. Berlin and New York: Mouton de Gruyter. Cognitive Linguistics Research 16.
- , 2008. Sequential and Summary Scanning: A Reply. *Cognitive Linguistics* 19.571-584.
- , 2009. *Investigations in Cognitive Grammar*. Berlin and New York: Mouton de Gruyter. Cognitive Linguistics Research 42.
- , 2012a. Linguistic Manifestations of the Space-Time (Dis)Analogy. In Luna Filipović and Kasia M. Jaszczolt (eds.), *Space and Time in Languages and Cultures: Language, Culture, and Cognition*, 191-215. Amsterdam and Philadelphia: John Benjamins. Human Cognitive Processing 37.
- , 2012b. Interactive Cognition: Toward a Unified Account of Structure, Processing, and Discourse. *International Journal of Cognitive Linguistics* 3.95-125.
- Shen, Ya-Ming. 1996. The Semantics of the Chinese Verb “Come”. In Eugene H. Casad (ed.), *Cognitive Linguistics in the Redwoods: The Expansion of a New Paradigm in Linguistics*, 507-540. Berlin and New York: Mouton de Gruyter. Cognitive Linguistics Research 6.
- Tai, James H-Y. 1985. Temporal Sequence and Chinese Word Order. In John Haiman (ed.), *Iconicity in Syntax*, 49-72. Amsterdam and Philadelphia: John Benjamins.
- Talmy, Leonard. 1988. Force Dynamics in Language and Cognition. *Cognitive Science* 12.49-100.
- Taylor, John R. 1996. *Possessives in English: An Exploration in Cognitive Grammar*. Oxford: Oxford University Press/Clarendon.
- van Hoek, Karen. 1997. *Anaphora and Conceptual Structure*. Chicago and London: University of Chicago Press.
- Velázquez-Castillo, Maura. 1995. Noun Incorporation and Object Placement in Discourse: The Case of Guaraní. In Pamela Downing and Michael Noonan (eds.), *Word Order in Discourse*, 555-579. Amsterdam and Philadelphia: John Benjamins. Typological Studies in Language 30.