

The 6th China International Forum on Cognitive Linguistics

Language, Culture and Mind:

10 lectures on development, evolution and cognitive linguistics

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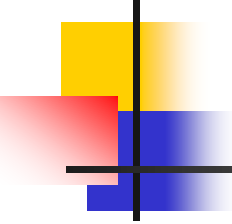
Lecture 9

Language as a biocultural niche and social
institution



What I want to convince you of

- The biology of language needs to be understood in both evolutionary and ecological terms
- Language is a biocultural niche and ecological artefact
- Grammar is not innate
- Language is a social, semiotic and normative institution, and can be formally so defined and analyzed



The traditional paradigm in the human sciences

- Culture is opposed to Nature
- Culture (like language) is uniquely human
- Language can therefore be either part of (unique) human nature (nativism), or part of (unique) human culture (environmentalism)
- Or there is an interaction between the two (genes and environment) so that it is part of both
- Language learning is viewed as the “exposure” of an organism to an “input” which the learner must internalize



Problems

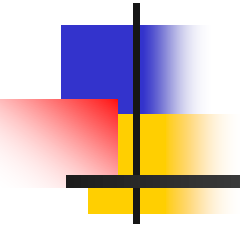
- The human genome is not sufficiently unique for nativism to be plausible
 - 95-98% overlap with chimpanzee genome
 - No difference of orders of magnitude in genetic material available for coding (hgp)
 - Therefore the human language capacity is probably not genetically encoded
- Culture is not uniquely human
 - Suggesting that culture is part of nature
 - So we need a biological account of culture
 - And perhaps a cultural account of human biology



Biology and culture

- Doesn't this mean sociobiology?
- No, though (for example) E.O. Wilson has indeed made a similar point (the theory of consilience)
- However, reductionism is not the only alternative: the theory of *epigenesis* proposes that, developmentally, the constructivist relationship between biology and culture is a two-way street
- An *ecological* approach to the language environment views language, not as an "input" to an information processor, but as a support and constraint on effective organismic action
- *The first part of this presentation proposes a theoretical synthesis of epigenetic and ecological approaches, in an extended Darwinian framework*

Part One



Biology of language: ecology and
epigenesis



Neo-Darwinism: the standard story

- Q: What is the unit of selection?
- A: The gene, or (sub-)populations of interacting genes.
- Q: What does the selecting?
- A: The environment (natural selection) or other genes (sexual selection and kin selection)
- Q: What is selected?
- A: Fitness
- Q: What's that?
- A: Differential reproductive success



The problem with neo-Darwinism

What is actually selected (“site of selection”)?

- Genes do not come singly but as combinations (genotypes) “packaged” in organisms (phenotypes)
- So at the very least it is organisms, not genes, which are subject to direct selection pressure
- Technically: the *replicator* is the organism, not the gene.
- The level of *organism* is essential for understanding epigenesis
- Organisms are morphological individuals (though not “essentially” and perhaps not necessarily), but morphology is not the site of selection
- It is the functioning, behaving organism which is the replicator and site of selection (Piaget: The leading role of behaviour in evolution)



Darwinism beyond neo-

Darwinism Integrating ecology into evolution

- Neo-Darwinism is based upon population genetics plus a shaky “central dogma”
- It neglects the causal role in the shaping of the environment by the organism
- Examples:
 - The path, the prey and the predator
 - The hoof and the steppe
 - Beavers and bower birds: animal artefacts
 - The termite mound and the “group organism”



Constructing your own affordances

- In Gibson's ecological psychology, affordances constitute the environment for effective action and perception (behaviour)
- But Gibson neglects the fact that affordances may be constructed by the animal (nests are for nesting, burrows are for burrowing)
- In such cases, the site of selection can be considered to be the organism in its *self-constructed* niche (organism-niche coupling)



Laland et al.'s model

- A phenogenotype is a species-specific organism-niche combination, functionally equivalent to an organism (cf Dawkins' "extended phenotype").
- (my definition): a class of interacting genes in a bound but not genetically determined relationship with some aspect of a self-constructed environment
- So the *site of selection* is now *organism plus artefact*



Human culture and language

- From an ecological-evolutionary point of view, culture is phenotypic
- Human culture is symbolic and linguistic
- Language is an artefact/niche, and the capacity to use and acquire it involves the evolution and replication of a phenotypical “biocultural complex”
- Succinctly: the human language capacity is phenotypic, not “inscribed in the genes”
- How, then, do individuals acquire language?



Epigenetic development

- Elaboration
- Construction
- Unidirectionality (time's arrow)
- Irreversibility
- Examples:
 - Birdsong
 - Human natural language



Epigenesis defined

- In epigenesis the developmental trajectory and final form of the developing behaviour are a consequence both the environmental information, and of the genetically encoded information.
- A genetically specified initial behavioural repertoire is *elaborated* through experience of a relevant environment, yielding an envelope of potential trajectories and outcomes.
- The process of elaboration is *directional*, and once it has taken place the initial plasticity of the embryonic, or unelaborated, repertoire is largely (though not necessarily wholly) lost.
- Epigenesis involves a developmental transition from relative organismic plasticity and informational openness, to relative rigidity and informational closure.



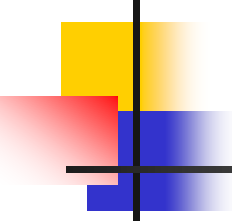
Epigenesis and the symbolic species

What makes humans unique is not an innate language acquisition device plus a variety of other species-specific innate cognitive modules, but a generalized semiotic or symbolic capacity epigenetically developed from a suite of cognitive capacities largely shared with other species, but attaining higher levels of organization in humans.



Learning and using a language

- The grammar of the language is *in the language*, just as the structure of the nest is in the nest. The capacity for language is thus a cognitive-behavioural relationship between language user and the constituents of language, just as the capacity for building a nest is a cognitive-behavioural relationship between the builder and the constituents of the nest; and it is this *relationship* that, in each case, has been selected for in evolution.
- There is no need for the organism to possess an internal model of the grammar of a language to account for language acquisition, any more than the building of a nest requires an internal model of the nest.



Epigenesis, ecology and evolution

- Augmented epigenesis is advantageous for organisms in which phenogenotypic couplings are both frequent and variable, which is an appropriate general description of the human cultural organism.
- Regulatory genes augmenting epigenetic openness can therefore be expected to have been phenogenotypically selected for in the human genome
- This in turn permits further adaptive selection for domain-specific learning in the semiotic biocultural complex, in particular for language.



The contextuality of language

- The class of organisms with the language capacity (normally developing humans) is thus a phenogenotypic replicator systemically associated with a wider biocultural complex of symbolic and constructive cognitive capacities, also of a phenogenotypic nature
- Individual language acquisition and use is situated in the contexts of actuation of these inter-related capacities, and is therefore profoundly socially and semiotically contextual



Language and other artefacts

- The language artefact/niche is culturally and materially situated, that is, dynamically embedded within a semiotic network which includes other symbolic and non-symbolic artefacts.



MEDELTIDSURET
DOMKYRKAN LUND



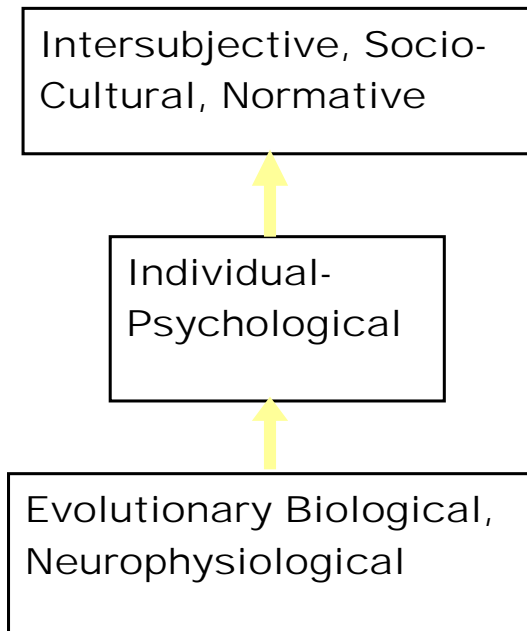
Extended embodiment (What it means to be human)

- The human organism, by virtue of the semiotic status of the body and the normative shaping of its activities in a cultural field, has a "dual ontology"
- It is both culturally constituted as a constituent of the semiosphere and, at a purely biological level, a genetic individual.
- The body is part of the system which extends beyond the body, as well as being the originating *sine qua non* of that system.
- While non-human organisms are simplex, the human organism is duplex, and its coupling with constructed niches involves a developmental process of auto-construction.

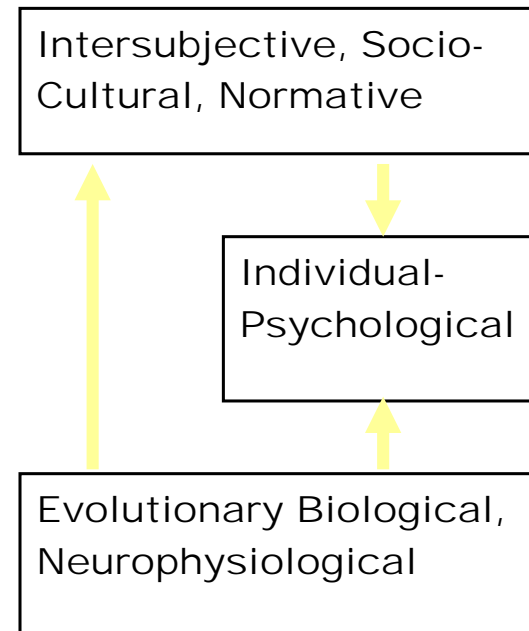


Two Views of Evolution and Development

The Traditional View



The Alternative View





Part Two

Language as social fact and social
institution



Social Facts: Durkheim

- “a category of facts which present very special characteristics: they consist of manners of acting, thinking, and feeling external to the individual, which are invested with a coercive power by virtue of which they exercise control over him.” (Durkheim, 1982 [1895]).
- The *objectivity* of social facts thus consists in the fact they are independent of any single individual's thoughts or will.



Ontology and methodology of social facts

- social facts are irreducible to psychological facts, structures or processes, though they depend upon these and influence them
- Social facts are *objects* of shared, mutual, intersubjective knowledge
- Language is a social fact (institution)



The semiotic ontology of the social: a brief formal account

John Searle on social (institutional) facts:

X counts as Y in C (ontext)

Example: a twenty dollar bill *counts as* a monetary token with this particular exchange value.

NB: the note does not *stand for* or *represent* twenty dollars, it *is* twenty dollars. It is self-identical; its value is subtended by (though non-reducible to) its material existence. Destroy the note, you destroy the value.



Representation and standing for

- *The conditions on representation*

"To represent something ... is to cause something else to stand for it, in such a way that both the relationship of 'standing for', and that which is intended to be represented, can be recognized."

(Sinha 1988: 37)



Signs and signification

[X counts as S & S stands for M] in C

X= anything

S = sign

M = meaning (signified)

This simple notation clarifies the “double articulation” of the sign, the conventional unity of substance and signification.

Note:

C may now include *C_{ss}*, the sign system, and *C_c*, the community of users



The subsystems of language

1. Grammar (in the wide sense):

X counts as S in C_{ss} for C_c *or*

X counts as S in L

L = This language

2. Semantics

Presupposing 1:

S stands for M in L

3. Pragmatics

Presupposing 1 & 2:

X counts as A_s in C

A_s = This speech act (including reference)



Some consequences

- The semantic theory of meaning is underdetermined by this formulation, and need not be truth-functional, but *is* conventional and normative (as are all the subsystems)
- Semantics is distinguished from pragmatics without necessitating a truth functional semantics
- Contextual dependence characterises all subsystems, but does not erase the distinctions between them
- Language as a social object has its own proper structure subtended by but irreducible to intentionality



Summary

- What is special about human culture is not its mere existence, but its symbolic nature
- Language is an artefact/niche, not an “input” to be “internalized” as structure
- Language is situated by other semiotic artefacts
- The human language capacity is not innate, but epigenetically developed and phenogenotypic
- There is no mental grammar. Grammar is a social institution, normatively regulating conduct, and we learn what is necessary to *act in it*.



Future directions

- The cognitive sciences must move beyond the classical (individualist-mentalist) cognitivist paradigm, and take seriously the normativity constituting social life
- Language and language learning are matters of participation and interaction in an intersubjective field constituted by symbolic, as well as non-symbolic, but signifying, artefacts
- Embodiment extends beyond the body, meaning is grounded not just in brains, but also in the world



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