生成文法・生物言語学の方法論

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Goals

- Naturalization/Biologization of Language
- Elucidation of the Human Nature

Methodology

- Naturalism (Language as a natural object)
- Internalism
- Rationalism
- Nativism
- Minimalism
  - Formal minimalism
  - Ontological minimalism

Basic Assumptions and Claims

- Language is a uniquely human biological trait.
- Language is perfect.
- Language has an innate foundation (Universal Grammar).

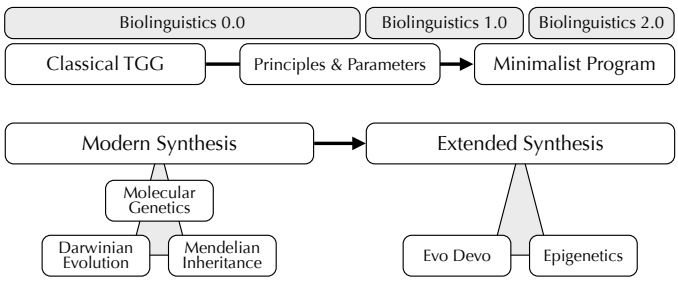
Major Topics

- Design
- Development
- Evolution
- Neural Basis
- Genetic Basis

cf. Tinbergen's four questions:

- Proximate explanations
  - Mechanism (Causation)
  - Ontogeny
- Ultimate explanations
  - Adaptation
  - Phylogeny

Generative Grammar and Modern Biology: Parallel Development



THE GENERATIVE GRAMMAR OF THE IMMUNE SYSTEM

Nobel lecture, 8 December 1984

by

NIELS K. JERNE

Château de Bel

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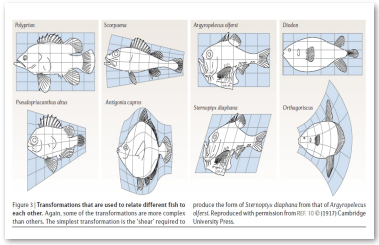
It seems a miracle that young children easily learn the language of any environment into which they were born. The generative approach to grammar, pioneered by Chomsky (4), argues that this is only explicable if certain deep, universal features of this competence are innate characteristics of the human brain. Biologically speaking, this hypothesis of an inheritable capability to learn any language means that it must somehow be encoded in the DNA of our chromosomes. Should this hypothesis one day be verified, then linguistics would become a branch of biology.

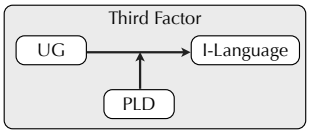
- We want to see how ... the forms of living things, and of the parts of living things, can be explained by physical considerations, and to realise that in general no organic forms exist save such as are in conformity with physical and mathematical laws.

D'Arcy W. Thompson.1917/42. *On Growth and Form.*



Three Factors in Biological Design (incl. Language Design)

- Genetic factor
- Environmental factor
- Physical/mathematical laws



- Third factor considerations reduce the power of the first and second factor but still it is their interaction that counts.

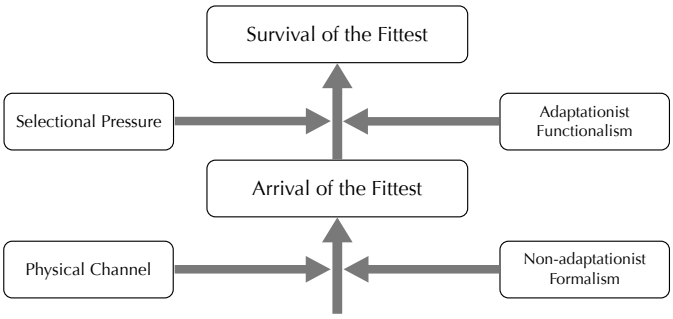
Towards a Teleomatic Explanation

- Apparent goal-directedness:
  - Teleology
  - Teleonomy
  - Teleomaticity

Language is a snowflake.

- ... the snowflake's delicate sixfold symmetry tells us that order can arise without the benefit of natural selection.

S. Kauffman. 2002. *Investigations*.



Classical vs. New Nativism

- P&P Model: Overspecified UG
  - Highly modular architecture
  - Rich parameters
  - Strong genocentrism
  - Gene = blueprint
- Minimalism: Underspecified UG
  - Minimum architecture (Merge-only)
  - No parameters (in the biological sense)
  - Non-genocentrism
  - Gene = toolkit

Language Acquisition as a Hypothetico-Deductive Process

- The child constructs a correct "hypothesis" on the target grammar, by falsifying wrong hypotheses based on the limited data available.
- How is this great achievement possible at all? (PoS)
- UG minimizes the search space, by excluding all incorrect hypotheses (impossible grammars) in advance.

Universality and Diversity

- Principles & Parameters: Rise and Fall
- Narrowing down the Parametric Space
  - Borer-Chomsky Conjecture: Variation limited to the lexicon
  - Berwick-Chomsky Conjecture: Variation limited to morphophonology
  - Strong Uniformity: Syntax/Semantics is uniform.
- Anti-lexicalism: There is no lexicon. Everything is post-syntactic.

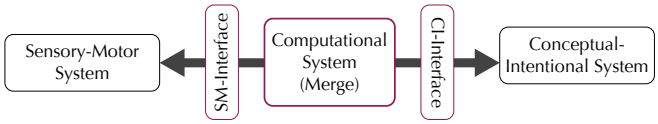
No Parameters in the End ...

- UG parameters are biologically/evolutionarily implausible.
  - Shortage of evolutionary time
- Parametric variations are all reflexes of cultural evolution.
- Language acquisition is mostly guided by the third factor.

Human Language: Basic Architecture

- Strong Minimalist Thesis:

  Merge + Interfaces = Language



- Structure Dependency
- Discrete Infinity
- Recursiveness

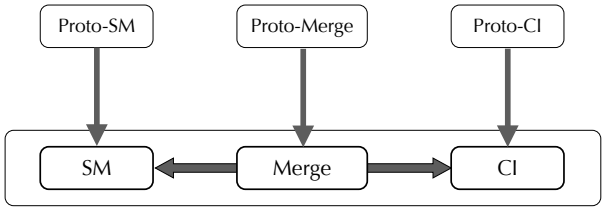
- ... the essential art of science, revealed everywhere, is reduction of "complex visibles to simple invisibles," as Nobel laureate in physics Jean Baptiste Perrin put the matter.

  N. Chomsky. 2013. Problems of projection.

- The physicist's problem is the problem of ultimate origins and ultimate natural laws. The biologist's problem is the problem of complexity.
- The biologist tries to explain the workings, and the coming into existence, of complex things, in terms of simpler things. He can regard his task as done when he has arrived at entities so simple that they can safely be handed over to physicists.

  R. Dawkins. 1986. *The Blind Watchmaker.*

Modular Architecture / Mosaic Evolution



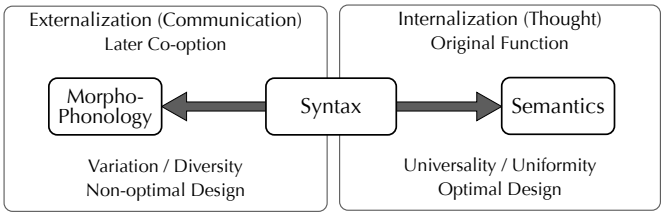
- Modular autonomy guarantees evolvability.

Deeper Questions and Answers

- Logical Problem of Language Acquisition (Plato's Problem)
- Explanatory Adequacy
- How?

- Logical Problem of Language Evolution (Darwin's Problem)
- Evolutionary Adequacy / Biological Adequacy
- Why?

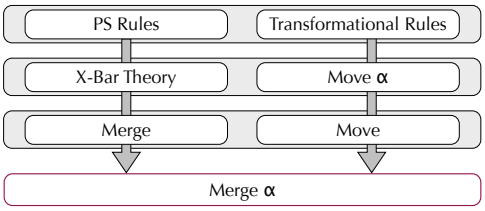
Interface Asymmetry



- Syntax applies blindly.
- Its outputs yield perfect instructions for semantic/phonological interpretation.
- Forms determine functions, not vice versa.

Minimizing the Narrow Language Faculty

- Phrase Structure Theories



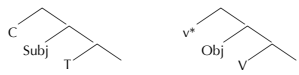
- Projection-free / Label-free
- Lexicon-free / Feature-free
- No endocentricity
- Order-free

Relating the Unrelated

- Island Constraints → Subjacency Condition
- NIC + TSC → Binding Theory
- CEDs → ECP
- HMC + Superraising + Superiority → Relativized Minimality/MLC
- ECP + EPP → Labeling by minimal search

Driving Syntactic Computation by the Third Factor

- C-T = v*-V



- [C [α Subj T [β Subj v* [γ Obj [V Obj]]]]]
  - Subj-raising = Obj-raising, forced by labeling
    - → yielding EPP (V = T = Root, subject to parametric variation)
  - Further raising is always possible with Obj, but not with Subj (ECP).
    - → C remains a phase head unless deleted; v* is always deleted.

To Round Up ...

- The Generative Enterprise:
  - An attempt to obtain a deeper understanding of the human language as a biological system, and of the human nature in the physical world.