

# Syntax, Communication, and the Evolution of Language

# Universal Grammar and Evolution

- Early-Chomsky (1965)
  - UG is large set of arbitrary syntactic rules
    - ‘language’ = computational principle
  - Syntax rules could not be learned
    - Poverty of Stimulus
  - Syntactic rules could not evolve
    - exaptation

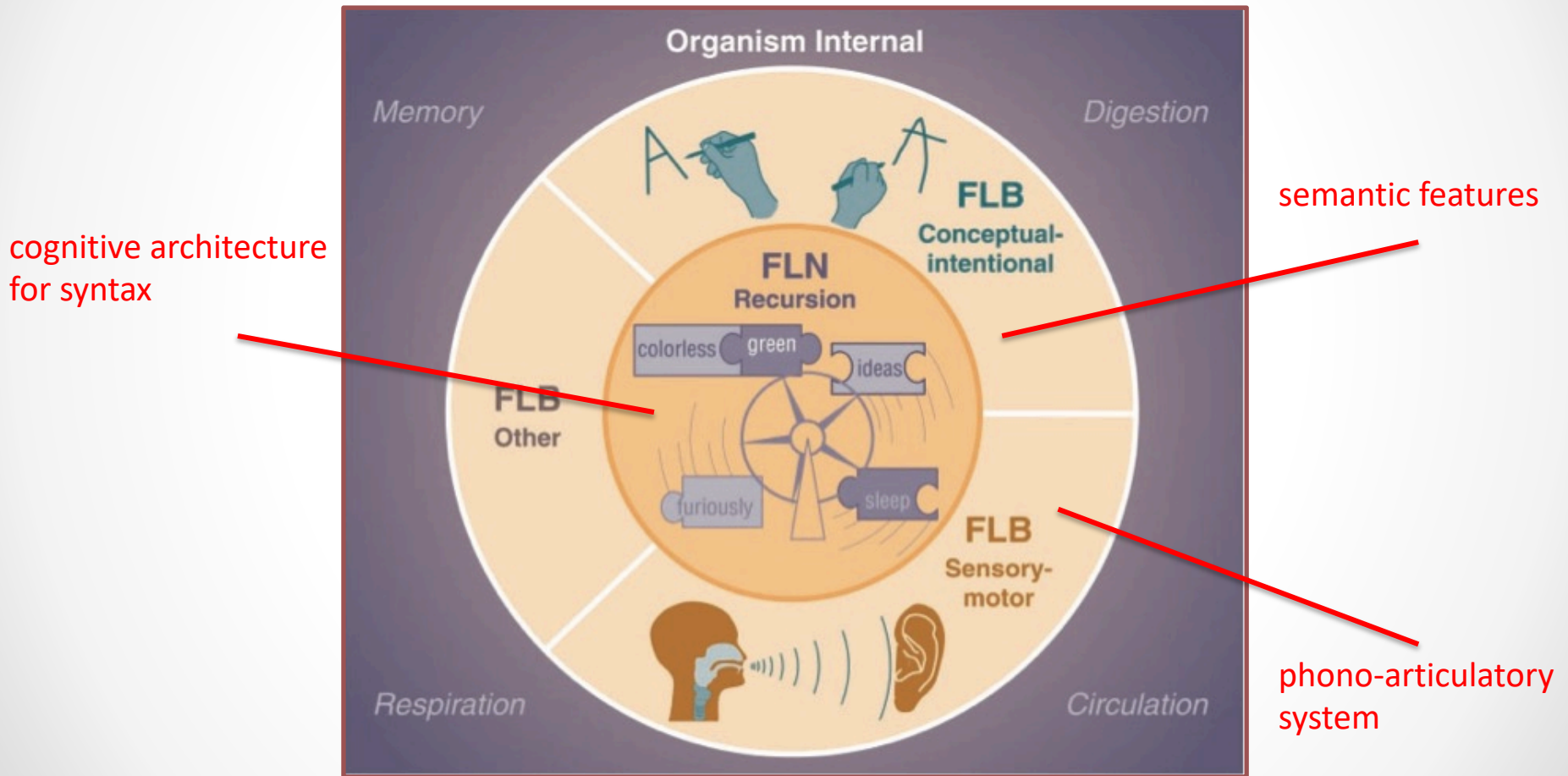
# The Minimalist Program

- Later-Chomsky (1995 on)
  - UG is FLN (Narrow Faculty of Language): **computational principle of recursion** (Hauser, Chomsky & Fitch 2002)
    - “FLN takes a finite set of elements and yields a potentially infinite array of discrete expressions.” (ibid. p.1571)
  - FLN is Merge (Berwick & Chomsky 2016)
    - Merge combines two (or more) units into **hierarchically ordered** strings
      - “simplest possible computation”

# The Minimalist Program (Chomsky 1995)

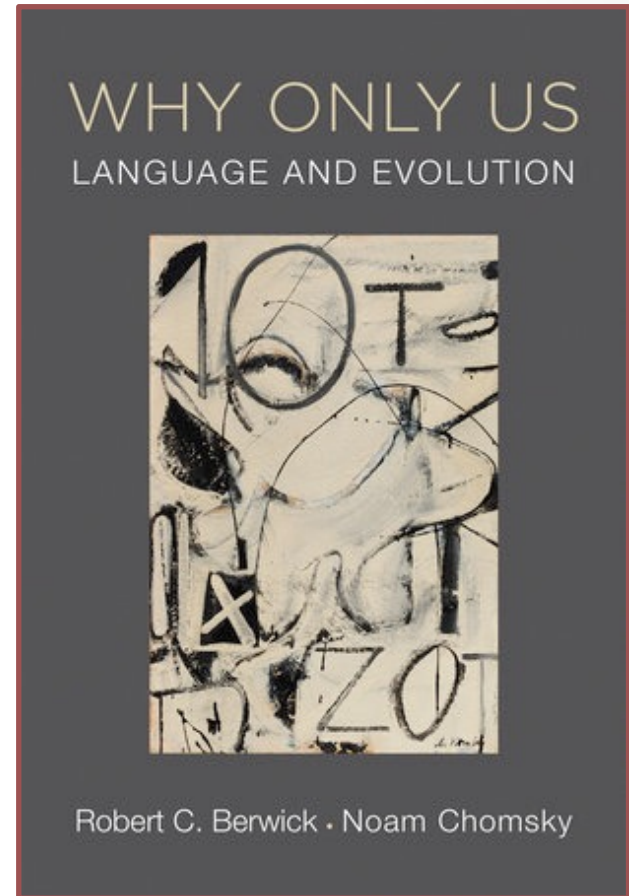
- Later-Chomsky (1995; see Berwick & Chomsky 2016)
  - Syntactic rules are **side effects of physical instantiation of Merge**
    - emergence no longer needs to be explained
  - Merge must be explained
    - more plausible target for **natural selection**

# Evolution of the FLB and FLN (Hauser, Chomsky & Fitch 2002)



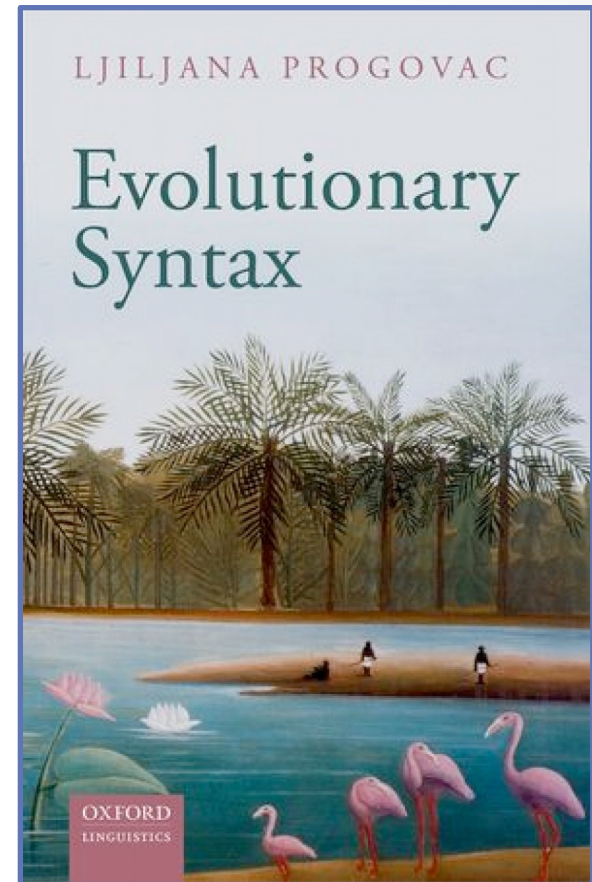
# Berwick and Chomsky on the evolution of language

- Merge (FLN) emerged in a single step (saltationism)
  - selected for thought and planning
- Conceptual-intentional interface (FLB) emergence not understood
- Sensorimotor system (FLB):
  - gradualistic (Pinker & Bloom 1990)
  - selected for communication?



## Progovac's challenge

- Merge (FLN) emerged in steps
  - gradualism
  - selected for communication



# Progovac's gradualism (see also Glackin 2012)



- pressure for expressively powerful language →
- cultural selection for superior linguistic tools
- biological selection for mechanisms for syntax

(1) Holophrases

(2) **Non-hierarchical** pairs

(3) Hierarchical strings



# Challenges to Progovac?

- If speakers lack structured thoughts at (1), from where does pressure for expressive power come?
- Why must **biological** (not cultural) selection can explain Merge?



# Outstanding questions?

- What drove **selection for Merge**-like structures?
  - Thought and planning (Berwick & Chomsky 2017)
  - Tool use (Stout & Chaminade 2012; Planer & Sterelny 2021)
  - Sequence learning (Chater & Christiansen 2017)
  - Communication (Progovac 2015)

# Outstanding questions?

- Did syntax appear by **saltation** or **gradually**?
  - natural language vs. language
- Are Merge-like structures/syntax **uniquely human**?



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