The Minimalist Program

Less is More

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A Program

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- What follows are some of the more recent developments from MP.

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Consider: Barriers: Locality in 1986

- *Government:* In the structure …α…[$_\gamma$ … δ… β…], α does not govern β if γ is a projection of δ excluding α
- *Blocking Category:* γ is a blocking category for β if and only if: γ is a maximal projection AND γ is not L-marked γ dominates β
- *L-Marking:* α L-marks β if and only if α is a lexical category and α directly theta-marks β
- *Direct Theta Marking:* α directly theta marks β if and only if β is the complement of α in the sense of X-bar theory.
- *Barriers:* γ is a barrier for β if and only if :
  - (I) (Holds for both government and movement) γ is a maximal projection AND
    - (a) γ immediately dominates δ, δ a blocking category for β OR
    - (b). γ is a blocking category for β and γ ≠ IP OR
  - (II.) (holds only for government) γ is the immediate projection of δ, a zero level category distinct from β.

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The Minimal Link Condition: MLC 1995

- Move to the closest potential landing site.

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Some Basics of Minimalist P&P theory

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- Note that there are really two major kinds of operations in the approach we've developed:
  - Sticking stuff together (the three X-bar rules, the insertion transformations)
  - Moving stuff around (Head movement, DP Movement, Wh-movement)

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Some Basics of Minimalist P&P theory

- Note that there are really two major kinds of operations in the approach we've developed:
  - Sticking stuff together (the three X-bar rules, the insertion transformations)
  - Moving stuff around (Head movement, DP Movement, Wh-movement)
- In MP, these are reduced to two very general operations:
  - *MERGE*: Join two things together into a constituent
  - *MOVE*: Move something somewhere.

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Background: Generative Grammar

- In the early part of the 20th century, linguistics was dominated by structuralism and behaviorism.
- These approaches viewed language as learned from the environment; in principle, languages could differ "unpredictably and without limit."

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Paradox 1

- Chomsky: the behaviorists can't be right.
- Language is impossible to learn from environmental input alone – this is "the logical problem of language acquisition".
- Solution: Children must come to the task of language acquisition with most of the structure of language already in place.

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Generative grammar

- Recall our three metrics of adequacy for a theory of grammar:
  - Observational (corpus data)
  - Descriptive (judgments) .
  - Explanatory (acquisition) .

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Problem!

- As generative grammar developed, the rule systems required for descriptive adequacy in various languages began to look very different from each other.
- So descriptive adequacy was achieved (partly), but at the cost of explanatory adequacy.
- How could children learn systems that were so radically different?

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Principles and Parameters

- A resolution of this tension can be found in the Principles and Parameters framework.
- Basic idea: Different languages don't have different rule systems.
- They share a set of universal principles, and their differences are restricted to a small set of parameters.

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Paradox 2

- There is a problem with this, similar to the logical problem of language acquisition: the problem of language evolution.
- P&P theory attributes a rich and highly abstract structure specific to language to the brains of all humans.
- This structure is shared without observable variation across the species.

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Paradox 2, cont.

- But: language hasn't been around that long!
- Many people suspect that the archaeological "great leap forward", about 50,000 years ago, corresponds to the emergence of language.
- That's nowhere near enough time for something so complex to evolve and become uniform across all humans.

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Innateness Redux

- Recall this question from your first HW:

  "Above, we argued that some amount of syntax is innate (inborn). Can you think of an argument that might be raised against innateness?"

- The problem of language evolution is such an argument.

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The solution: Minimalism.

- The idea: refine what we mean by innate.
- Clearly, syntax is universal among humans.
- This doesn't mean that it's genetically specified, however!
- That is, maybe the rules of syntax largely come from somewhere other than genes devoted to language, perhaps from "outside".

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Three factors

In a recent paper, Chomsky identifies three factors which enter into language:

1. Experience of the local language
2. Genetic specification of the language faculty
3. General principles which govern all physical systems

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The third factor

- So, the generative revolution can be seen as a rejection of the idea that factor 1 (experience alone) solely determines the properties of language.
- The solution to the evolutionary paradox comes from shifting the burden from factor 2 (genetics) to the third factor (external principles).

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Where does syntax come from?

- One possibility is that the principles of syntax are essentially the laws of physics –conservation of energy, minimal action, etc. – seen in the abstract.
- Then the principles of syntax are of the same character as the geometrical regularity seen in various biological domains.
- Such regularity arises not through genetic programming, but through the way physical law constrains the possible forms of organisms.

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Another formulation of Minimalism:

- Language is a means of linking sound and meaning.
- In a sense, the properties of sound (e.g., how our mouths can move) and meaning (the cognitive structures we share with other primates) are given in advance.
- Language is then a solution to the problem of linking these two systems.

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The Minimalist question

- How good a solution is language to the problem set by the systems it links? (articulation/perception on one side, cognition/conception on the other)

- The Minimalist Hypothesis: language is a "perfect" solution to this problem.

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What does this mean?

- Start with the assumption that language is as simple as it possibly can be.
- Departures from maximal simplicity – from "conceptual necessity" – should only be accepted when rigorously motivated by empirical evidence.

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Two kinds of Minimalism

- Methodological: theories in general should be as simple as is consistent with the facts. Occam's razor, essentially.
- Substantive: language really IS simple, a close to optimal solution to the linking problem.

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Minimalism in action

- Language is an infinite recursive system.
- Any such system requires an operation which combines two elements to produce a new element.
- The simplest such operation is set formation.
- Minimalist: Sets are necessary; perhaps they're sufficient.

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Sets and Merge

- Let us call making a set of A and B **Merge** (A,B).
- Assuming that Merge is the core of syntax has an unexpected side benefit:
- We can explain our mysteriously overdeveloped mathematical abilities.
- Merge applied to one item (or nothing) produces objects which correspond in a natural way to numbers – Merge underlies counting.

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Internal and External Merge

- In the simplest case, Merging A and B doesn't "do anything" to A and B.
- They remain available for further operations.
- This will be the key to explaining movement, which previously had been viewed as an "ugly" property of language.
- In the Minimalist framework, we will see that a system **with** movement is simpler than one without it!

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A simple example

- Suppose we have words A, B, and C. We perform the following operations:
- Merge (A, B) → {A, B}
- Merge ({A, B}, C) → {C, {A, B}}
- Merge ({C, {A, B}}, A) → {$\underline{A}$, {C, {$\underline{A}$, B}}}
- Note: A appears twice in the end structure
- There's nothing wrong with this; we would need additional stipulations to prevent it.

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I-Merge: Copy Theory of Movement

- But consider: this is movement!
- Two copies of an item appear in the structure.
- The meaning component can interpret both copies (as in wh-movement, where the moved element can be interpreted in the base position as object of a verb, and in its raised position as the focus of a question).
- The sound side will usually choose to pronounce just one copy – but not always! Recall Haitian Creole "li", and young children pronouncing multiple copies of wh-words.

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Cyclicity

- Movement is just a special case of Merge, the general structure-building operation, so we expect them to proceed in lockstep.
- There is no D-structure, with everything in theta-positions, followed by S-structure, where all the movements and expletive insertions happen.
- Everything – insertion of new words and transformations – occurs in a single derivation, proceeding "bottom-up".

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Levels of representation

- Dumping D-structure and S-structure also serves another minimalist goal.
- Among things we should minimize are levels of representation.
- Ideally, language has just two such levels, the levels where it interfaces with the sound and meaning components of the mind.
- D-structure and S-structure are both extra levels, and so we should do away with them if we can.
- Recasting movement as part of a single derivation virtually forces this anyway.

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Sorry... these slides are incomplete

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