Naïve theories of language and linguistics

Anybody with an average amount of formal education has some ideas and beliefs about language, grammar, linguistics, and linguists.

- Language is a means of communication.
- Grammar is a set of prescriptive rules for the “proper” use of language.
- Linguistics is an art or science in which such grammars are written for the public, to help them become better speakers of their language.
- Linguists know the grammatical rules of a language, so they can and must educate the public about how to speak and write properly.
- You must learn the grammatical rules of your language in school, or you won’t be able to speak and write properly.
- Children learn their mother tongue from their mothers. (And then they go to school where they learn the grammatical rules of their language.)
- Nobody knows the grammatical rules of their language unless they go to school and are taught those rules (by teachers who have learned them from linguists by reading their books or being taught by them in universities).
Linguistics: The Science of Language

Why are these beliefs naïve?
- often incoherent
- not supported by evidence
- often based on myths
- vague concepts
- misunderstandings

Linguistics: The Science of Language

Preliminaries

What is (a) science?

What is (a) natural language?

Linguistics is the science of natural language.

How is linguistics the science of natural language?

What is “natural” about natural language?
Science

A form of inquiry
activity
something that people do

a form of knowledge
a mental object
something in the mind

How do people do science?
What is its purpose?
What is its result?
How is it different than other forms of inquiry?

In whose mind?
What is this mental object like?
What is special about scientific knowledge?
How is scientific knowledge different than other forms of knowledge?
What is it represented by?
What good is it? What is it for?
How is it “born”?

The Nature of Scientific Inquiry (1)
Science is a subjective, active, and creative process.

Science is a SUBJECTIVE process
Subjective: ‘proceeding from or taking place in a person’s mind rather than the external world’

• A form of cognition
• A mental process
• Theories constructed in individual minds
• The content of individual minds is private and personal (= subjective).
• Knowledge is private and personal.
• Illusion of “objectivity” of science and of scientific knowledge
Science is an ACTIVE process
- Mental activity of constructing hypotheses
- Internal mental activity
- Mental system ("knowledge")
- Knowledge — product of mental activity
- Knowledge constructs knowledge
- Knowledge — internal to the mind
- Mind — not a passive container or receiver
- Mind — active constructor
- “The mind does what it can with what it has.”

Science is a CREATIVE process
Creativity of a system: the power or ability to produce something that has not existed before
- The human mind — a creative system
- What does it create? — Knowledge, understanding (theories)

The scientific cycle (first approximation)
(1) Observation (intuitive, theory-independent?, done by an empty mind?)
  ⇔ (2) Hypothesis
  ⇔ (3) Test hypothesis (observation informed by hypothesis)
    ⇔ (4) Modify hypothesis
    ⇔ (5) Test hypothesis
    ⇔ (6) Modify hypothesis ⇒ …

Q & A about “(1) Observation”
- What is observed? — What the mind is prepared to observe.
- Are observations “objective”? — No.
- Is the observing mind empty and innocent? — No.
- What does every mind contain? — Theories ("Prior knowledge").
- Are these theories formal? — Some are formal, some are informal.
- ⇒ Observations are based on and determined by hypotheses.
The scientific cycle (modified, final)
Scientific inquiry is theory-driven.

(1) Hypothesis (make explicit)
    ⇝ (2) Observation (to test and amend hypothesis)
    ⇝ (3) Modify hypothesis
    ⇝ (4) Test hypothesis
    ⇝ (5) Modify hypothesis ⇒ ...

Questions you can answer and problems you can solve now
Why is science a subjective process?
Why is knowledge private and personal?
Why is the objectivity of scientific knowledge an illusion?
How is science an active process?
Explain how knowledge constructs knowledge.
Explain how science is a creative process.
Explain how every observation is determined by a hypothesis and how an understanding of this leads to a condition of explicitness in theory construction.

The Nature of Scientific Inquiry (2): Knowledge

Science < L scientia ‘knowledge’

What constitutes scientific knowledge?
• Formal theory — systematic
• Explicit — clearly stated assumptions, definitions, derived conclusions
• Coherent — logical-conceptual “cement”
• Consistent — no contradictions
• Adequate — appropriate, sufficient, “good”
• Arguments — reasoned conclusions
• Evidence — data, empirical “facts”, proof
• Theory-driven — based on hypotheses/theories

What is the hallmark of scientific knowledge?
• See above.
• Consensus? — No.
• Commitment & enthusiasm? — No.
• Skepticism
How do we decide which theory is “right”, “correct”, or “true”?

- No knowledge is “right”, “correct”, or “true.”
- Question — not answerable, has no content, rejected as meaningless.
- New question

How do we decide which theory to trust or believe?

- Competing theories — rivals
- Authority? — No.
- Arguments and evidence — number, quality, and weight
- Criteria of judgment — metatheoretical conditions, requirements
  - “Methodological”, metatheoretical requirements
    - Consistency
    - Economy
    - Exhaustiveness
    - Explicitness
- Adequacy conditions — Observational, Descriptive, Explanatory

Questions you can answer and problems you can solve now

If science is subjective, how is it that we trust sciences, scientists, and scientific knowledge?

Some people trust science to the extent that they believe scientific knowledge to be “objectively true.” Why is that belief not justified?

How can you characterize the trust we have in science and scientific knowledge?

What conditions are imposed on scientific theories?

Where do the normative conditions on science originate?

Explain how competing theories are each other’s rivals.

What is an argument?

Explain the significance of explicitness in formal theory construction.

What is meant by the requirement of consistency?

How are dates treated and used in empirical sciences like linguistics?

What does the principle of economy mean?
Evaluating Competing Hypotheses: An Example

The Problem — language acquisition
How does a child learn its first language?

Competing hypotheses

Hypothesis A: Imitation.

Hypothesis B: Children creatively construct a mental grammar of their first language on the basis of an innate language-acquisition capacity.

Hypothesis A: Imitation

Major features
- Assumption: “blank slate” = no innate abilities
- Learning = experience
- Stimulus—response based
- Reinforcement — success rewarded (and errors corrected) = Teaching
- Prediction: children know what they have experienced/been taught

Hypothesis B: Innate language-acquisition capacity

Major features
- Assumption: innate language-acquisition device, UG
- Acquisition = construction of mental grammar (≠Learning)
- Language input — helps set parameters of UG
- Acquisition without teaching
- Prediction: creative language use
**Analysis, comparison, evaluation, observations**

**Assumptions**
- Ability to imitate must be innate — not recognized in A ☹
- Innate abilities — recognized in B ☻

**“Observational adequacy,” evidence, and predictions**
- No teaching — A: L1 is taught ☹. B: L1 is acquired ☻.
- Knowledge of L1 — A: = experience; B: more than and ≠ experience
- Use of L — A: retrieval, no productivity ☹. B: creative, productive ☻.

**Summary**
- Inadequacies in A
- A — counter-factual predictions; B — predictions observationally verified
- A — cannot account for observed facts; B — accounts for observed facts

**Conclusion**
Hypothesis A is rejected as untenable. Hypothesis B is superior (“the winner”).

**Questions you can answer and problems you can solve now**
Compare the blank slate hypothesis and the innateness hypothesis of language acquisition and point out some important differences.
Why and how is the innateness hypothesis superior to the blank slate hypothesis of language acquisition?
Explain the element of truth in saying that the blank slate hypothesis is essentially another (poor) variant of some innateness hypothesis.
Explain how it is that certain questions simply do not even arise under a hypothesis.
Explain how the assumptions of a hypothesis “automatically” or “naturally” lead to, i.e., raise questions.
Linguistics as a (natural) science

Some general features (cf. its goals)
- Descriptive and explanatory
- Not prescriptive, normative, or regulative

Subject-matter: Language = linguistic competence

Goal: to account for competence
- To construct a model of the native speaker’s knowledge of his/her language (= competence)
- To explain how knowledge of a language is attained
- To describe the nature of language

Method: as in the “natural sciences”
- Construct explicit hypotheses supported and tested by empirical evidence
- Verify the empirical adequacy of your hypothesis. Modify if necessary

What is (a) Language?

1. A ‘tool’ for communication? — What tool? 😐 
3. A set of utterances / sentences. — Infinite set 😐
4. A form of knowledge, a faculty. — This is the “tool” or knowledge that constructs an infinite number of sentences. 😐
1. **Language as “tool” for communication**
   - Traditional, functional—function of language: communication
   - “Tool” not characterized, taken for granted, ignored
   - Focus on communication: language = communication
   **Motivation:** People “use” language to communicate with each other.
   **Remains unaccounted for:** What is it that they use?
   **Language acquisition:** Knowledge of language taken for granted. The question of how knowledge of language is attained does not arise

2. **Language as communicative behavior**
   - Language = use of language, communicative behavior
   - Behaviorism: the topic of inquiry is human verbal behavior
   - Empirism: science is based on observed data
   **Motivation:** Speech behavior — rule-governed activity. Presupposes (without inquiring into) understanding of the rules language users know.
   **Remains unaccounted for:** No distinction made between (1) the rules of *language* and (2) the rules of *language use*, two different rule systems.
   **Language acquisition:** stimulus–response, reinforcement, experience

3. **Language as a set of utterances / sentences**
   - Language = objects produced in the use of language (utterances).
   - Structuralism
   - Empiricism
   **Motivation:** Observed patterns classified, as in the “natural sciences.”
   **Remains unaccounted for:** creativity of language
   **Language acquisition:** As in behaviorism.
4. **Language as a form of knowledge, a mental faculty**
   - Modern (generative) linguistics
   - Distinction between language and use of language

**Motivation (realization):** Speakers of a language must possess a form of knowledge that enables them to construct and understand an infinite number of sentences.

**Language acquisition:** Grammars ‘grow’ and gradually maturate in children’s minds (very much like the way a bird grows its wings and learns to fly).

It accounts for the observable phenomena of language use by looking beyond the “bare facts”, by constructing hypotheses about the knowledge of speakers that enables them to perform linguistic behavior. It also has an answer to how that knowledge is **constructed in human minds**.

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**What is (a) grammar?**

A grammar of a particular language is a theory of that language.

A grammar of language is a theory of language—a Universal Grammar.

**The term ‘grammar’ is systematically (?) ambiguous:**

1. The internalized elements and rules of a language in the minds of its speakers: a **mental grammar** of a language.
2. A **theory of the mental grammar** of a language.
Goals and requirements of generative grammars

Observational adequacy: Generates all and only the sentences of a language.

Descriptive adequacy: Represents the native speaker’s intuition (synonymy, ambiguity, surface similarity and underlying difference).

Explanatory adequacy: Offers a principled explanation for the intuition of the native speaker, in terms of general, universal principles of language structure and language acquisition.

Universal Grammar

Particular languages have a lot in common. Those common properties are reflected in particular grammars of particular languages. The properties shared by all languages need not be stated in particular grammars; they will be stated only once—in UG. This also predicts that those languages must have those properties in common, i.e., the fact that they do have those properties in common is not a matter of coincidence (‘things could not be otherwise’).

This represents the conviction (to be justified by cross-linguistic evidence) that observed differences across languages are variations. Each natural language is a variant of natural language. Linguistic variation is restricted. The hypothesis predicts that any natural language will, because it must, share fundamental properties with all other natural languages. Informally, at some sufficiently abstract level of generalization, every human language has the same structure. Accumulating evidence increasingly strongly suggests that this hypothesis is correct.

UG is shared by all humans because it is innate.