Linguistics: The Science of Human Language
Supplementary Readings

The following readings have been posted to the Moodle course site:

- Contemporary Linguistics: Chapter 1 (pp. 1-14)
- Language Instinct: Chapter 1 (pp. 1-11)
Some Opening Questions

What is linguistics?

The study of language (duh!)

The scientific study of human language.

OK, but why study human language?

Because our ability to learn and use human language constitutes a profound biological mystery.
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- The **scientific** study of **human** language.
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OK, but why study human language?

- Because our ability to learn and use human language constitutes a **profound biological mystery**
Like all core mental faculties, the miraculous nature of language is obscured by how effortless it seems to us.
Language as a Biological Mystery

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- When you see a book, you ‘just see it’.
  - You’re not aware of all the incredible neurological computation that goes on.
Language as a Biological Mystery

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- When you see a book, you ‘just see it’.
  - You’re not aware of all the incredible neurological computation that goes on.

- When you speak/understand, you ‘just do it’
  - You’re not aware of all the incredible neurological computation that goes on.
An Illustration

Close your eyes, and listen to this sentence:

Aardvarks from Eastern South Africa have a special, triangular pocket in their abdomens that they use to store rocks and sometimes small rodents.
An Illustration

Close your eyes, and listen to this sentence:

- Aardvarks from Eastern South Africa have a special, triangular pocket in their abdomens that they use to store rocks and sometimes small rodents.
An Illustration

What Happened?

I put a thought into your head. But not with 'magic' or telepathy; I did it by making sounds with my mouth. Moreover: your thinking this thought was automatic (like a reflex, you couldn't help it). The thought was incredibly specific (wasn't just about 'aardvarks' in general). The thought was one you'd never thought before (I put a new 'piece of information' into your head).
An Illustration

What Happened?

► I put a thought into your head.

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- Moreover:
  - Your thinking this thought was automatic
    - (like a reflex, you couldn’t help it)
  - The thought was incredibly specific
    - (wasn’t just about ‘aardvarks’ in general)
  - The thought was one **you’d never thought before**
    - (I put a new ‘piece of information’ into your head)
The Uniqueness of Human Language

In this way, human language is unlike anything else in the natural world.

It’s fundamentally unlike other animal communication systems (LING 101)

- In terms of the kind of information it can convey
- In terms of the kind of *combinatoric system* it is
The Fundamental Question

How do we do all of this?

- What kinds of computations are going on in our brains that make all of this happen?
The Fundamental Question: How Do We Do It?

One Obviously Wrong Answer: Maybe, with our big brains, we just memorize a *ton* of expressions (like thousands)?

- After all, memorizing is a **big** part of learning a language.
- When we acquired (learned) English, we had to just memorize:
  - “dog” = *canis familiaris*
  - “kick the bucket” = *die*
  - ?? “Pencils taste woody” = *Pencils taste woody* ??
The Fundamental Question: How Do We Do It?

Why Is This ‘Obviously Wrong’?

- Although memorizing single expressions is a big part of language learning, *it’s not the only part...*
The Fundamental Question: How Do We Do It?

Why Is This ‘Obviously Wrong’?

- Although memorizing single expressions is a big part of language learning, *it’s not the only part...*
- ... Because you can understand complex expressions that you’ve never heard before:
  - Aardvarks from Eastern South Africa have a special, triangular pocket in their abdomens that they use to store rocks and sometimes small rodents.
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... so learning a language is more than just memorizing expressions.
The Fundamental Question: How Do We Do It?

Why Is This ‘Obviously Wrong’?

► Although memorizing single expressions is a big part of language learning, *it’s not the only part*...

► ... Because you can understand complex expressions that you’ve never heard before:

► Aardvarks from Eastern South Africa have a special, triangular pocket in their abdomens that they use to store rocks and sometimes small rodents.

... so learning a language is more than just memorizing expressions.

... so what else is there?...
The Fundamental Question: How Do We Do It?

A Thought Experiment:

- Suppose I taught you the following words of Kikuyu:
  “kĩhĩĩ” = the boy  “mũitũ” = the girl  “nĩkĩaonire” = saw

▶ Would you be able to translate ‘The boy saw the girl’ into Kikuyu?

▶ No, because I haven’t told you the rules for combining the words.
The Fundamental Question: How Do We Do It?

A Thought Experiment:

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The Fundamental Question: How Do We Do It?

A Fundamental Insight:

When you know a language, what you know is:

- A memorized set of individual, basic expressions (words, idioms)
- A set of rules, for combining those basic expressions

The Importance of Rules (LING 101)

- The rules are what give human language its unique expressive power.
- The rules are what sets human language apart from other animal communication systems.
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The Fundamental Question, Rephrased

How do we do all of this?

- What is the system of **rules** and **expressions** that underlies our ability to use a human language?
The Fundamental Question, Rephrased

How do we do all of this?

► What is the system of rules and expressions that underlies our ability to use a human language?

But, how do we answer this question?...
Here’s one, totally wrong line of thought:

- If you wanna know the rules for rugby, just ask someone who knows how to play to explain them!
Towards an Answer

Here’s one, totally wrong line of thought:

▶ If you wanna know the rules for rugby, just ask someone who knows how to play to explain them!

▶ So, if you wanna know the rules of some language, just ask someone who speaks the language to explain them!
Why This is Totally, Obviously Wrong:

Our knowledge of the rules of our language is **subconscious** (tacit)

- Speakers aren’t *conscious* of the rules of their language...
- All the computation takes place *subconsciously*...
- And so, speakers can’t just introspect and tell you what the rules are...
Answering the Question Through Science

The Problem of Tacit Knowledge:

Speakers can’t just *tell* us the rules of their language. So, how do we answer our fundamental question:

▶ What is the system of **rules** and **expressions** that underlies our ability to speak and understand a human language?
Answering the Question Through Science

The Solution to the Problem:

We have to do **science**! (Hypothesis & Test)

We have to:

- Make a **hypothesis** (dream up a possible answer)
- **Test** whether the hypothesis is correct:

We have to do science! (Hypothesis & Test)

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  - Determine the predictions of the hypothesis.
  - Check whether those predictions are true.
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The Solution to the Problem:

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We have to:

- Make a **hypothesis** (dream up a possible answer)
- **Test** whether the hypothesis is correct:
  - Determine the predictions of the hypothesis.
  - Check whether those predictions are true.
    - If they are not, the hypothesis *must* be wrong.
    - If they are true, the hypothesis *might* be right.
An Illustrative Example
Framing a Hypothesis

Let’s write a **rule** that will make (‘generate’) the following English sentences:

- Dave danced.
- Mary sang.
- Bill swam.
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**The Rule:**
To form an English sentence, combine a name (Bill, Mary, Dave) with an ‘action word’ (danced, swam, sang).
An Illustrative Example

Framing a Hypothesis

Let’s write a **rule** that will make (‘generate’) the following English sentences:

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**The Rule:**

To form an English sentence, combine a name (Bill, Mary, Dave) with an ‘action word’ (danced, swam, sang).

... This rule is our **hypothesis**.

... Now, let’s **test** it!
An Illustrative Example

Testing the Hypothesis

The Rule:
To form an English sentence, combine a name (Bill, Mary, Dave) with an ‘action word’ (danced, swam, sang).
An Illustrative Example
Testing the Hypothesis

The Rule:
To form an English sentence, combine a name (Bill, Mary, Dave) with an ‘action word’ (danced, swam, sang).

The Predictions:
▶ True Prediction: The following are all English sentences:
  ▶ Dave danced. Mary sang. Bill swam.
An Illustrative Example
Testing the Hypothesis

The Rule:
To form an English sentence, combine a name (Bill, Mary, Dave) with an ‘action word’ (danced, swam, sang).

The Predictions:

- **True Prediction:** The following are all English sentences:
  - Dave danced. Mary sang. Bill swam.

- **False Prediction:** The following are also English sentences:
  (Notation: ‘*’ = Not a possible sentence)
An Illustrative Example

Testing the Hypothesis

The Rule:
To form an English sentence, combine a name (Bill, Mary, Dave) with an ‘action word’ (danced, swam, sang).

The Predictions:

- **True Prediction:** The following are all English sentences:
  - Dave danced. Mary sang. Bill swam.

- **False Prediction:** The following are also English sentences:
  (Notation: ‘*’ = Not a possible sentence)

Conclusion:
The rule above, as stated, is not actually a rule of English grammar.

We need a new hypothesis, one that does not make those false predictions.
An Illustrative Example
Revising the Hypothesis

New Rule:
To form an English sentence, combine a name with an ‘action word’, in that order.
An Illustrative Example
Revising the Hypothesis

New Rule:
To form an English sentence, combine a name with an ‘action word’, *in that order*.

The Predictions:
- True Prediction: These are all English sentences:
  - Dave danced. Mary sang. Bill swam.
An Illustrative Example
Revising the Hypothesis

New Rule:
To form an English sentence, combine a name with an ‘action word’, *in that order.*

The Predictions:
- True Prediction: These are all English sentences:
  - Dave danced. Mary sang. Bill swam.
- True Prediction: These are *not* English sentences:

Conclusion:
The rule above, as stated, is not the only rule of English grammar. We need more rules, that will also ‘generate’ sentences like ‘Dave saw Mary’.
Linguistics: The Science of Human Language

Supplementary Readings
The Fundamental Question of Linguistics
Towards an Answer to the Question
The Problem of Subconscious Knowledge
Answering the Question Through Science
An Illustrative Example

How Language Is, Not How It Should Be

Summary

An Illustrative Example

Revising the Hypothesis

New Rule:
To form an English sentence, combine a name with an ‘action word’, in that order.

The Predictions:

- **True Prediction:** These are all English sentences:
  - Dave danced. Mary sang. Bill swam.

- **True Prediction:** These are *not* English sentences:
  - *Danced Dave.* *Sang Mary.* *Swam Bill.*

- **False Prediction:** These *aren’t* English sentences:
  - Dave saw Mary, Mary likes Bill, Bill hit Dave

Conclusion: The rule above, as stated, is not the only rule of English grammar. We need more rules, that will also ‘generate’ sentences like ‘Dave saw Mary’.
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Revising the Hypothesis

New Rule:
To form an English sentence, combine a name with an ‘action word’, *in that order*.

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- **True Prediction:** These are all English sentences:
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- **False Prediction:** These aren’t English sentences:
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Conclusion:
The rule above, as stated, is not the *only* rule of English grammar.

We need more rules, that will also ‘generate’ sentences like ‘Dave saw Mary’.
Language As It Is, Not As It ‘Should Be’

As scientists, linguists are interested in the *real world*
Language As It Is, Not As It ‘Should Be’

As scientists, linguists are interested in the real world

► Thus, linguists are interested in the rules speakers actually do follow...

► They aren’t interested in the rules that (some people think) speakers should follow...
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Vocabulary:

- ‘grammatical’ = used by fluent speakers of the language in real, every-day conversation
  - (People really do talk that way.)
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- Thus, linguists are interested in the rules speakers actually *do* follow...
- They aren’t interested in the rules that (some people think) speakers *should* follow...

**Vocabulary:**

- ‘grammatical’ = used by fluent speakers of the language in real, every-day conversation
  - (People really do talk that way.)
- ‘ungrammatical’ = never used by fluent speakers in real, every-day conversation
  - (People don’t really actually talk that way.)
Language As It Is, Not As It ‘Should Be’

Thus, all these are ‘grammatical’ English structures (even though ‘style manuals’ say not to use them):
Language As It Is, Not As It ‘Should Be’

Thus, all these are ‘grammatical’ English structures (even though ‘style manuals’ say not to use them):

- Stranding Prepositions: (Who did you talk with?)
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Thus, all these are ‘grammatical’ English structures (even though ‘style manuals’ say not to use them):

- Stranding Prepositions: (Who did you talk with?)
- Splitting Infinitives: (To **boldly** go ... )
Thus, all these are ‘grammatical’ English structures (even though ‘style manuals’ say not to use them):

- Stranding Prepositions: (Who did you talk with?)
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- Passive Voice: (Dave was hit by a car.)
Thus, all these are ‘grammatical’ English structures (even though ‘style manuals’ say not to use them):

- Stranding Prepositions: (Who did you talk with?)
- Splitting Infinitives: (To boldly go ... )
- Passive Voice: (Dave was hit by a car.)
- Double Negatives: (I didn’t see nothing.)
Language As It Is, Not As It ‘Should Be’

Thus, all these are ‘grammatical’ English structures (even though ‘style manuals’ say not to use them):

- Stranding Prepositions: (Who did you talk with?)
- Splitting Infinitives: (To boldly go ... )
- Passive Voice: (Dave was hit by a car.)
- Double Negatives: (I didn’t see nothing.)
- Adjectives as Adverbs: (I dance good.)
Language As It Is, Not As It ‘Should Be’

Thus, all the following are ‘ungrammatical’ English structures (even though some ‘style manuals’ say you should use them):

- Not-Stranding Prepositions: (*With whom did you talk?)
- Not-Splitting Infinitives: (*Boldly to go where no one has gone before.)
Thus, all the following are ‘ungrammatical’ English structures (even though some ‘style manuals’ say you should use them):

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  (* With whom did you talk?)
Thus, all the following are ‘ungrammatical’ English structures (even though some ‘style manuals’ say you should use them):

- Not-Stranding Prepositions:
  (* With whom did you talk?)

- Not-Splitting Infinitives:
  (* Boldly to go where no one has gone before.)
Summary
Language as a Biological Mystery

The following is a deep mystery of the natural world:

► What is the system of **rules** and **expressions** that underlies our ability to speak and understand a human language?

► (‘What do we **know** when we ‘**know** a language’?)
Summary
Answering the Question Through Science

Because our knowledge of the rules of our language is ‘tacit’ (unconscious), we can only answer this question through science (hypothesis & test)

- **We hypothesize** a system of rules and expressions.
- **We test** the predictions of that hypothesis.

  - We check whether the expressions the rule makes (‘generates’) are all really expressions of the language (*i.e.*, things people actually say).
  - We check whether there are expressions of the language that the rule alone doesn’t ‘generate’.
Summary
Linguists and Their ‘Rules’

As scientists, linguists are interested in the real world.

- Thus, they want to devise rules that reflect the way people actually do speak...

- They are not interested in rules describing the way that people should speak...

  - No linguist will ever tell a native speaker of a language that they ‘shouldn’t’ talk a certain way.