Linguistics: The Science of Human Language
Course 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?
Some Opening Questions

What is linguistics?

- The study of language (duh!)
Some Opening Questions

What is linguistics?

- The study of language (duh!)
- The **scientific** study of **human** language.
Some Opening Questions

What is linguistics?

- The study of language (duh!)
- The **scientific** study of **human** language.

OK, but why study human language?
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
Language as a Biological Mystery

Like all core mental faculties, the miraculous nature of language is obscured by how effortless it seems to us.

- 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)
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 *combinatorial 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*...
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.
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 what are we missing here?...
The Fundamental Question: How Do We Do It?

A Thought Experiment:

▶ Suppose you knew these words of Yalalag Zapotec:
  “tu” = a    “bekw” = dog    “xid” = cat    “blhelhe” = saw

▶ Would you be able to translate ‘A dog saw a cat’ into Yalalag Zapotec?

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

A Thought Experiment:

- Suppose you knew these words of Yalalag Zapotec:
  
  “tu” = a  “bekw” = dog  “xid” = cat  “blhelhe” = saw

- *Would you be able to translate ‘A dog saw a cat’ into Yalalag Zapotec?*
The Fundamental Question: How Do We Do It?

A Thought Experiment:

▶ Suppose you knew these words of Yalalag Zapotec:
  “tu” = a  “bekw” = dog  “xid” = cat  “blhelhe” = saw
▶ Would you be able to translate ‘A dog saw a cat’ into Yalalag Zapotec?
▶ No, because I haven’t told you the rules for combining the words
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)

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.
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)
- And also a set of **rules**, for combining those basic expressions
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)
- And also 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.
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?...
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!
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!
Towards an Answer

The Problem of Tacit Knowledge

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...
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:
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:
  - Determine the predictions of the hypothesis.
  - Check whether those predictions are true.
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:
  - 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.
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.

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:

- Dave danced.
- Mary sang.
- Bill swam.

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).

Testing the Hypothesis

The Predictions:
▶ True Prediction: The following are all English sentences:
Dave danced. Mary sang. Bill swam.
▶ False Prediction: The following are also English sentences:
*Danced Dave.* *Sang Mary.* *Swam Bill.* (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.
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'.

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:

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

Vocabulary:
▶ ‘grammatical’ = used by fluent speakers of the language in real, every-day conversation
▶ (People really do talk that way.)
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...

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?)
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 ... )
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.)
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.)
- Singular ‘They’: (If someone asks, let them know.)
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.)
- Singular ‘They’: (If someone asks, let them know.)
- 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):
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?)
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

A deep, unanswered question about of the natural world: ‘What do we know when we know a language?’

- What is the system of rules and expressions that underlies our ability to speak and understand a human 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’.
As scientists, linguists are interested in the real world.

- We want rules that reflect how people actually **do** speak
- We’re not interested in rules that tell people how they **should** speak...
  - No linguist will ever tell a native speaker of a language that they ‘shouldn’t’ talk a certain way.