# « Errare humanum est. »
# Refusing to appreciate this fact could be a big mistake

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# Nobody's perfect.

1993 Le Mans results

1st Porsche
2nd Porsche
3rd Porsche
4th Porsche
5th Porsche
6th Porsche
7th Porsche
8th Porsche
9th Sauber/BMW
10th Porsche



practice
Makes
Purfect!

**Did you read** :
Paris in the Spring ?

**Shame on you**! It said
'Paris in the the spring'

# Misperception

**Everyone makes mistakes**

**They are natural and**

**an important part of the learning process**

# **Wug tests** (Berko, 1958)

1. 3 surface manifestations of English regular plural /-z/: [z], [s], [əz]

2. When/how do children learn these rules?

3. **Test paradigm**

- Children are presented with a pretend creature and told, "This is a wug."
- Another wug is revealed, and the researcher says, "Now there are two of them. There are two __."

4. **Results**

- Very young children are baffled by the question and are unable to answer correctly, responding with e.g. "two wug."
- Children in grade 1 were almost fully competent with both [s] and [z].
- Both preschool and first-grade children dealt poorly with [əz], giving the correct answer less than half the time, possibly because it occurs in the most restrictive context.

5. **Major finding**

- The first experimental proof that young children have extracted generalizable morphological rules from the language around them.

This is a wug.
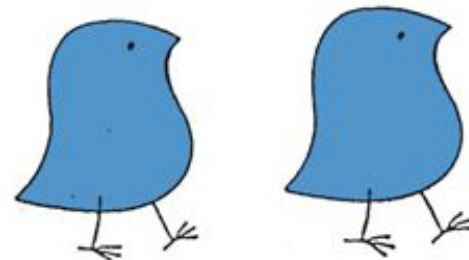
Now there is another one.
There are two of them.
There are two __.

# Evidence of hypothesis testing and rules

**Overregularization**

went ⇨ goed ⇨ went

# Examples of corrections

1. **Child**:       I taked a cookie

   Father:       Oh, you mean you *took*  a  cookie.

   **Child**:       Yes, that's right, I taked it.

2. **Child**:       Nobody don't like me

   Mother:    No, say: „Nobody likes me"

   **Child**:        Nobody don't like me

   (Dialogue repeated 8 times)

   Mother:     Now listen carefully, say „*Nobody likes me*"

   **Child**:       Oh, Nobody don't likes me.

# Attempts of correction 2

3. **Child**: Want other one spoon, Daddy

   Father: You mean you want *the other spoon*.

   **Child**: Yes, I want other one spoon, please, Daddy.

   Father: Can you say *the other spoon*

   **Child**: Other … one … spoon

# Attempts of correction 2

3.  Father:    Say … *other*

    **Child**:    Other

    Father:    *Spoon*

    **Child**:    Spoon.

    Father:    *Other spoon*

    **Child**:    Other spoon. Now give me other one spoon

# « Errare humanum est. »
# Refusing to appreciate this fact could be a big mistake

# Some of the questions I may address

1. **Eros (sorry, 'errors')**
   - What are they? (*errors* vs. *mistakes*)
   - Success, failure and things in between
2. **Can we and should we avoid by all means to make errors?**
3. **Which errors are important?**
   - When shall we pay attention to them? (misunderstanding)
   - What errors can safely (at least temporarily) be ignored?
4. **Why do we make mistakes** (causes)

# Some of the questions I may address

1. **Virtues of errors**
   - ▶ Should we be allowed to make errors?
   - ▶ Should we encourage students to make mistakes?
   - ▶ Benefits for the learner, teacher, researcher
   - ▶ Intelligent suboptimation (don't strive for perfection but for good compromises : acceptable deviations)

# Language production

**An ideal test-bed for the problem at hand**

- ▶ Plenty of opportunities to make mistakes
- ▶ Deviations are clearly <span style="color:red">visible</span>, revealing problems at different **levels** (lexical, syntactical, morphological, phonological, spelling, …)

# Many-to-many mappings:
## Grapheme-phoneme correspondances

| | | | |
|---|---|---|---|
| vin | wine | N-singular | DRINK |
| vins | wines | N-plural | DRINK |
| Je vins | I came | V-passé simple | MOUVEMENT |
| Tu vins | you came | V-passé simple | MOUVEMENT |
| Il vint | he came | V-passé simple | MOUVEMENT |
| …qu'il vînt | …that he came | V-imp.subjonctif | MOUVEMENT |
| Je vaincs | I win | V-présent | COMPETITION |
| Tu vaincs | You win | V-présent | COMPETITION |
| Il vainc | He wins | V-présent | COMPETITION |
| vaincs | win | Impératif | COMPETITION |

# A task decomposed into different layers
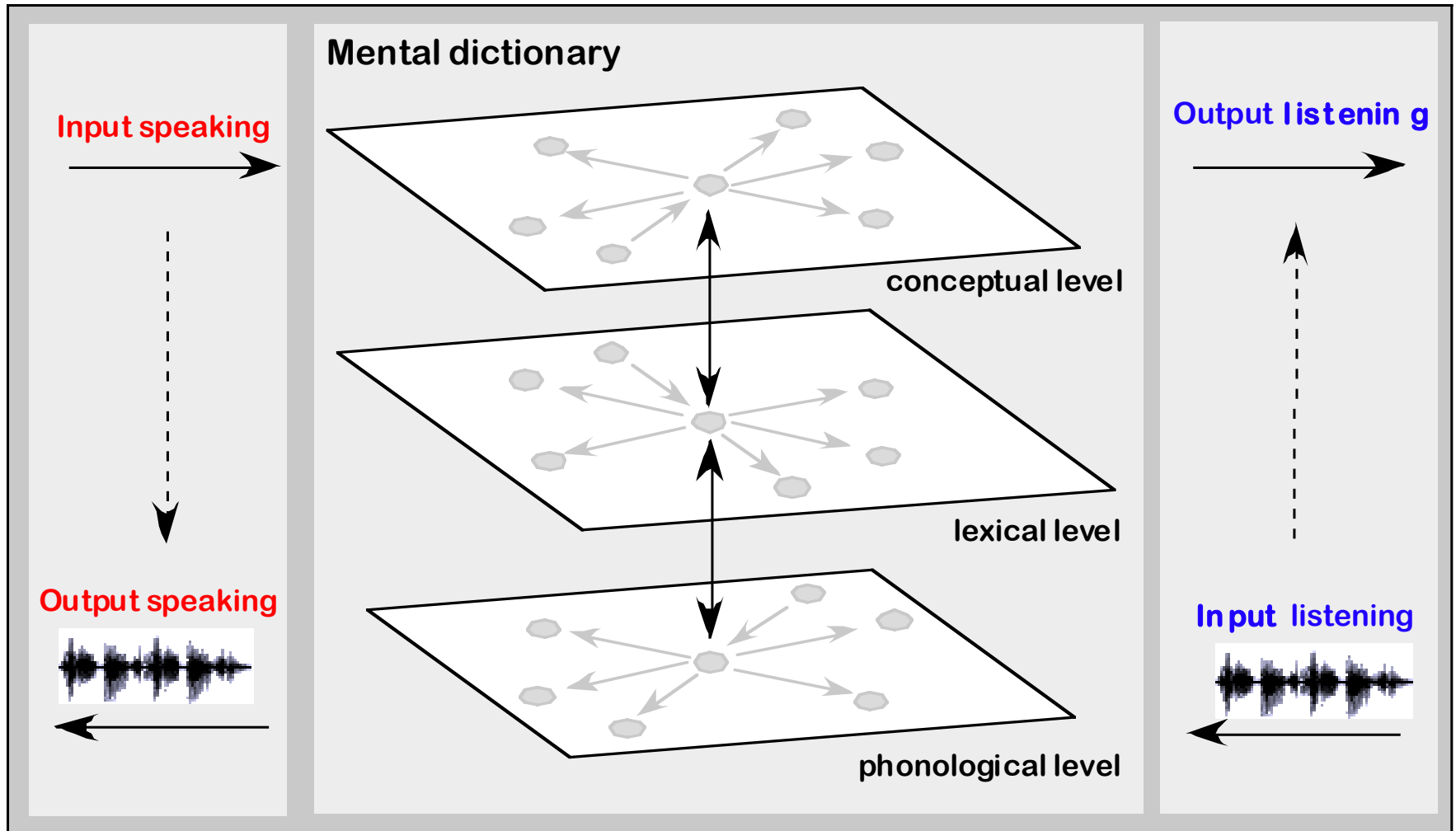
# Is it possible to succeed without making mistakes?

# Deliberate deviations

# Deliberate 'mistakes'

# The real reasons
## (piece or petrol)



"We 🐚Shell not EXXONerate Saddam Hussein for his actions. We will Mobilize to meet this threat to vital interests in the Persian Gulf until an AMOCOble solution is reached. Our best strategy is to BPrepared. Failing that, we ARCO◆ming to kick your ass."

# Errors *vs.* mistakes

## Mistake

▶ Lack of knowledge (competency)

## Errors

▶ Side-effect (performance)
   ⋯→ lack of **attention** (focussing on sth else, multi-tasking)
   ⋯→ exceeding **short-term-memory** (forgetting, problem of book-keeping, incremental processing)

# Errors *vs.* mistakes

## 1. Mistake

- « Africa is a big country » (G. Bush)
- "Africa is a nation that suffers from incredible disease" (G. Bush, Göteborg, Sweden, June 14, 2001)
- Being was confused about Africa's status Alaska's governor Sarah Palin asks whether "South Africa was part of the country".

# Errors *vs.* mistakes

## 1. Errors

- ▶ Lapsus linguae
- ▶ Tonguetwisters
- ▶ Side-effects
  - ⋯→ for exceeding the limits of STM (multiple embeddings : agreement errors, ….)
  - ⋯→ due to *lack of attention* (poor book-keeping, interference)

# Tongue-twisters

**Problems at the articulatory stage:** phonological similarities  /s/ *vs.* /sh/ *vs.* /tch/

Try to produce the following sentences quickly after having lacked sleep or a bit of alcohol

1. We surely shall see the sun shine soon.

2. She sells sea-shells on the sea-shore.

3. Which witch wished which wicked wish?

4. I thought a thought. But the thought I thought wasn't the thought I thought I thought.

# Lapsus linguae
based on V. Fromkin

## Meaning related

1. he's going up town  --->  he's going down town
2. you have too many irons in the fire --->   in the smoke

## Sound related

1. Don't consider this as a rejection on my part

    --->  "Don't consider this as an erection on my part
2. Persecution ---> prosecution
3. Histerical ---> historical

# Lapsus linguae
based on V. Fromkin

1. stick in the mud ---> smuck in the tid

   (consonant segments **exchange**)

2. ad hoc ---> odd hack

   (vowel segments **exchange**)

3. unanimity ---> una…mity

   (syllable **deletion**)

4. easily enough ---> easy enoughly

   (suffix **movement**)

5. tend to turn out ---> turn to tend out

   (words **exchange**)

# Some conclusion

**Words** are stored by **meaning** and **sound**

**Word** are **not** **stored** **alphabetically**
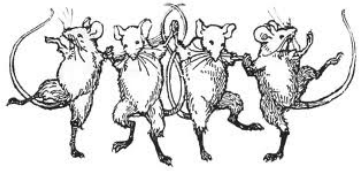
**Words** are **decomposed** into **different layers**

    1.    meaning

    2.    form

    3.    sound

# Why do we make mistakes ?

# Question

**What** is involved in **speaking** and
**why** is it **difficult**?

# The 3 principal steps

idea

concepts

form

abstract words/lemma
syntactic category
morphology

sound

phonemes
graphemes

The mice are dancing.

# The normal situation
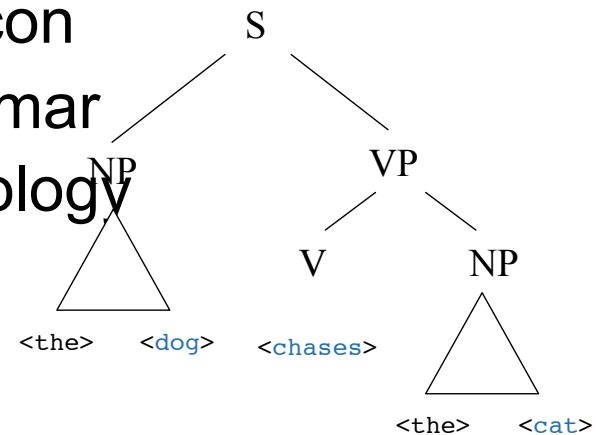## a cascaded flow of information
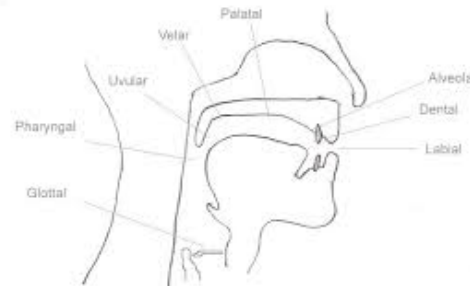
► Conceptualization



► Lexicon
► Grammar
► morphology

S
├─ NP
│   └─ △ <the> <dog>
└─ VP
     ├─ V <chases>
     └─ NP
          └─ △ <the> <cat>

► Formulation

► Articulation

# Constraint juggling

**Spontaneous discourse** is a *complex process*
requiring the processing of *various* **kinds** of information
*at various* **levels** under severe **space**- and **time**-constraints

ideas

word order

words

word forms

# Language production, a difficult task

1. **plan what to say** (conceptual level)

2. **find the adequate words** (linguistic level: lexicalisation)
3. **find appropriate sentence frame** (linguistic level: syntax)
4. **insert words in the right place** (linguistic level: syntax)
5. **add function words** (linguistic level: syntax)
6. **morphological adjustments** (linguistic level: morphology)

7. **articulate** (phono-acoustic level)

8. **plan next stretch while speaking** (conceptual level)

# Problems at the articulatory stage:

*Voiced* vs. *voiceless* fricatives: [ð] (this) vs. [θ] (thing)

How to pronounce the 'th' in English  [ð] vs. [θ]

1. Place tip of the tongue behind top teeth
2. Breathe out
3. Retract tongue
4. Vibrate air behind tongue and say
5. "The Smiths wear thin clothes througout the winter months"
6. Please, dont spit!

# Similar sounding words
## lacking phonemes

**Challenge :** try to convey the following telephone number in Chinese

**target** : 47 17 74
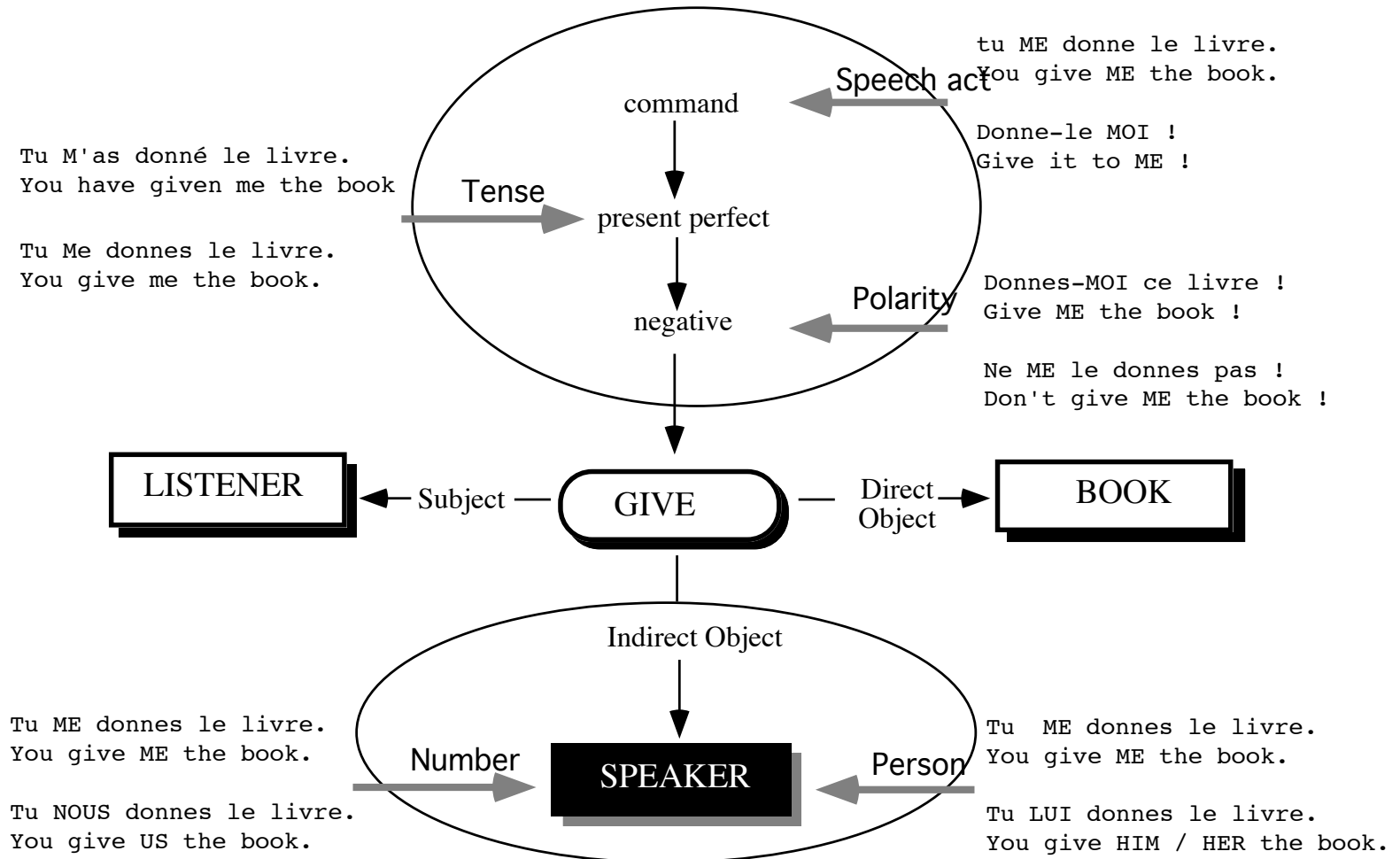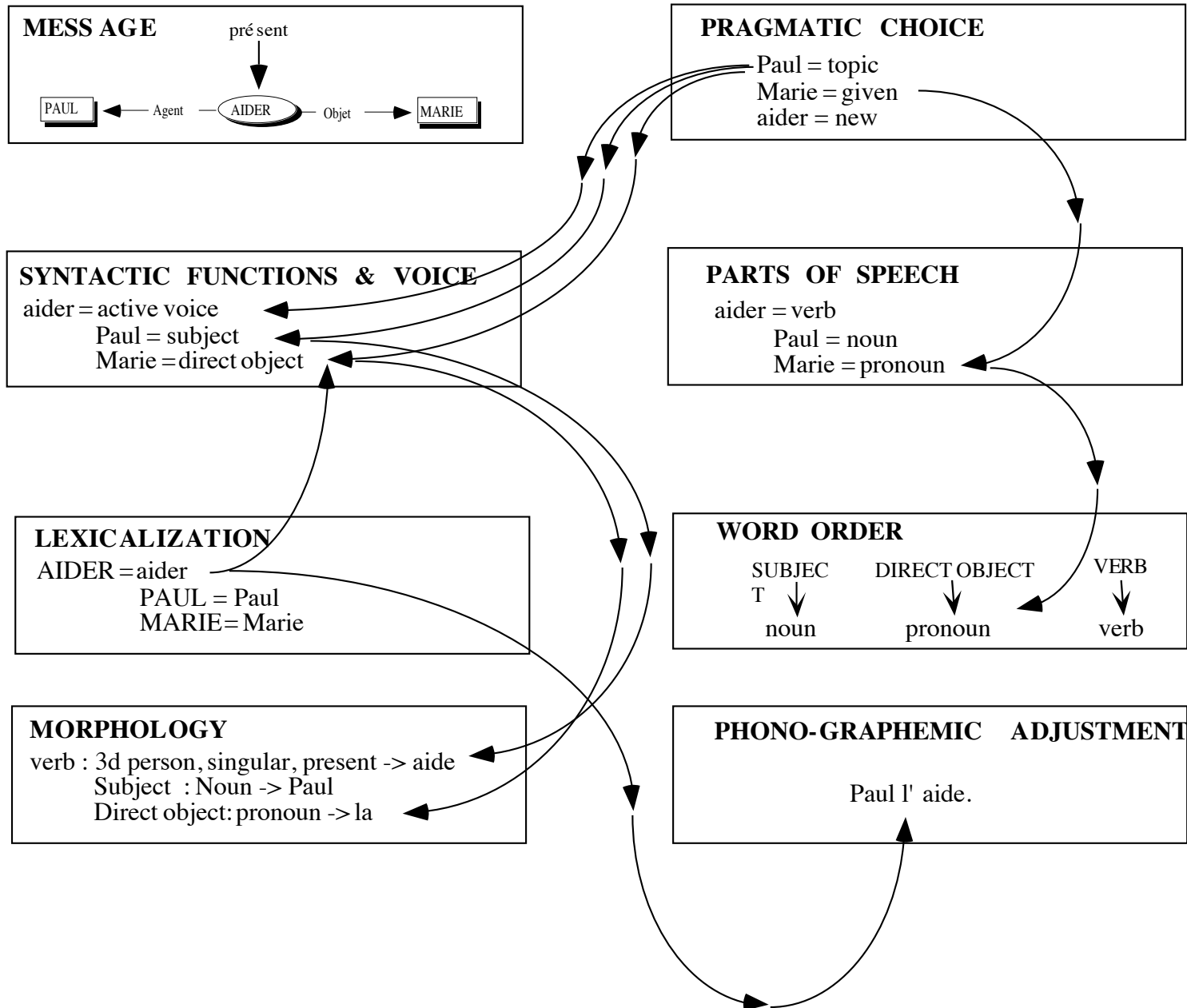
47:    sì shí qī

74:    qī shí sì

17:    shí qī

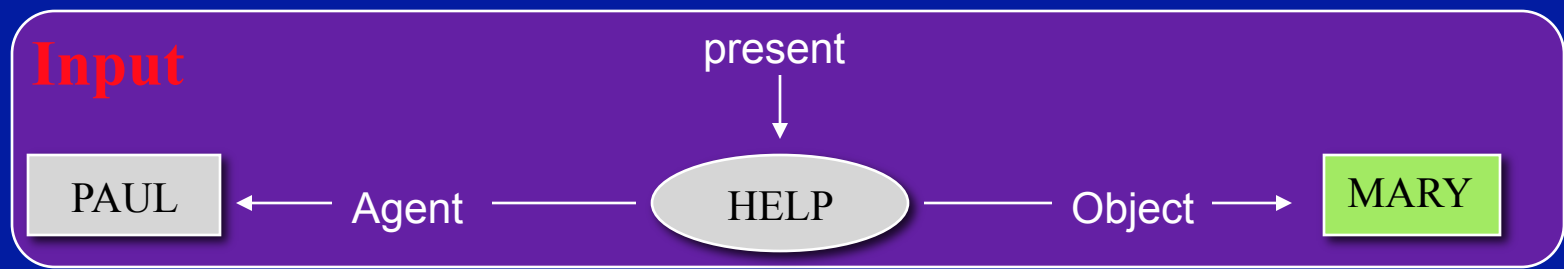# Beware of misunderstandings:
## *due to incorrect pronunciations*

# The Italian man who went to Malta

# The necessary information for synthesis is scattered all over



tu ME donne le livre.
You give ME the book.

Speech act

command

Tu M'as donné le livre.
You have given me the book

Tense

present perfect

Donne-le MOI !
Give it to ME !

Tu Me donnes le livre.
You give me the book.

negative

Polarity

Donnes-MOI ce livre !
Give ME the book !

Ne ME le donnes pas !
Don't give ME the book !

LISTENER  ← Subject —  GIVE  — Direct Object →  BOOK

Indirect Object

Tu ME donnes le livre.
You give ME the book.

Number

SPEAKER

Person

Tu  ME donnes le livre.
You give ME the book.

Tu NOUS donnes le livre.
You give US the book.

Tu LUI donnes le livre.
You give HIM / HER the book.

**MESS AGE**

pré sent

PAUL ← Agent — AIDER — Objet → MARIE

**PRAGMATIC  CHOICE**

Paul = topic
Marie = given
aider = new

**SYNTACTIC  FUNCTIONS  &  VOICE**

aider = active voice
Paul = subject
Marie = direct object

**PARTS  OF  SPEECH**

aider = verb
Paul = noun
Marie = pronoun

**LEXICALIZATION**

AIDER = aider
PAUL = Paul
MARIE = Marie

**WORD  ORDER**

SUBJEC T          DIRECT OBJECT          VERB

noun          pronoun          verb

**MORPHOLOGY**

verb : 3d person, singular, present -> aide
Subject : Noun -> Paul
Direct object: pronoun -> la

**PHONO-GRAPHEMIC   ADJUSTMENT**

Paul l' aide.

# Direct and indirect consequences of a choice

# Direct and indirect consequences of the verb choice

| | VERB CHOICE | | PRON | AUX | AGREEMENT |
|---|---|---|---|---|---|
| **C** | **AIDER** | Je | **les** | ai | aidés. |
| **H** | | | | | |
| **O** | | | | | |
| **I** | **VENIR EN AIDE** | Je | **leur** | suis | venu en aide. |
| **C** | | | | | |
| **E** | | | | | |
| **S** | **PORTER SECOURS** | Je | **leur** | ai | porté du secours. |

**C O N S E Q U E N C E S**

**Direct consequences :**
syntactic function (DO /IO)
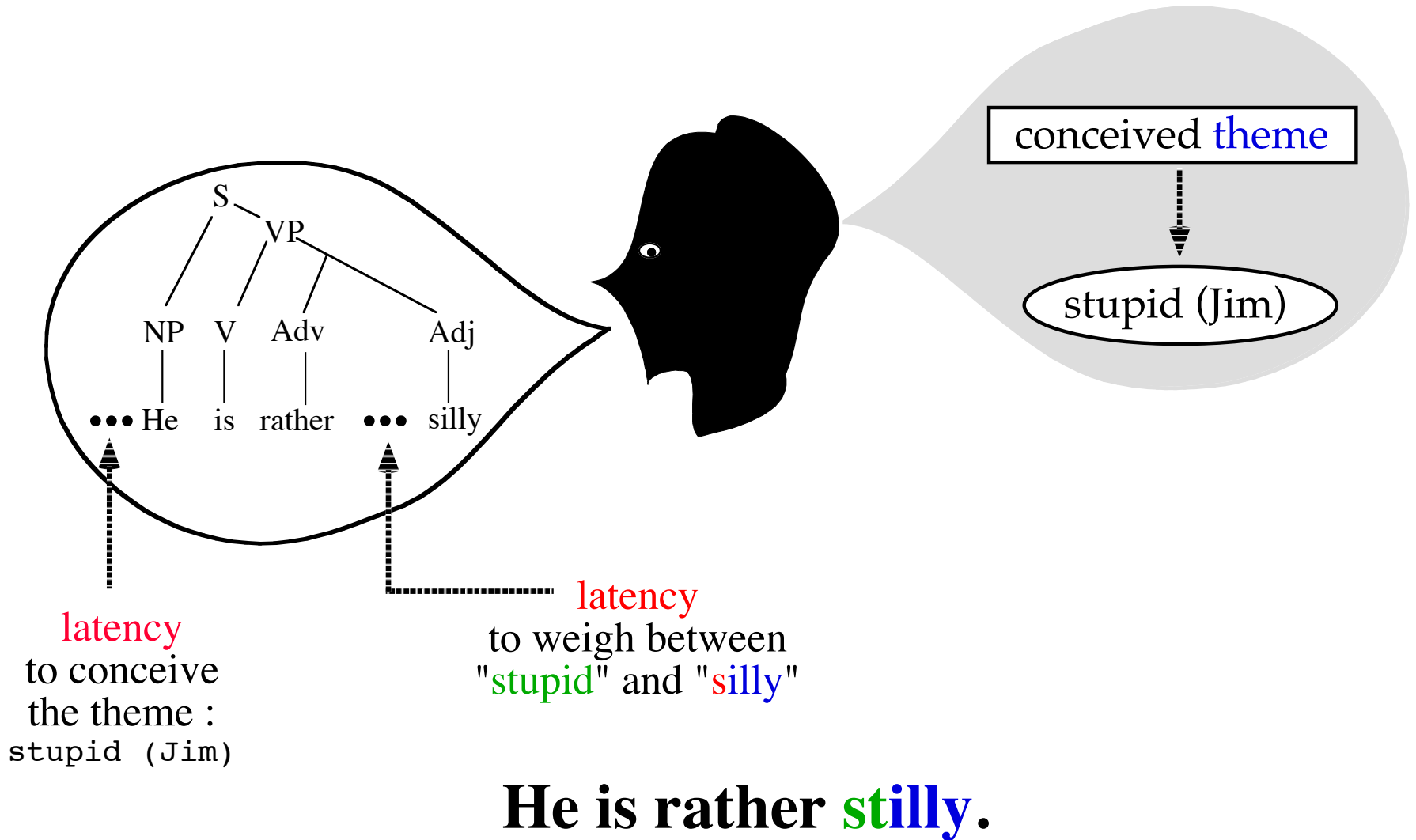type of auxiliary (être/avoir)

**Indirect consequences :**
form of the personal pronoun (les/leur)
verb ending : agreement (e/ées)

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# Errors when trying to generate a word

# What do you think of Jim ?

conceived theme

stupid (Jim)

S
VP
NP V Adv Adj
••• He is rather ••• silly

latency
to conceive
the theme :
stupid (Jim)

latency
to weigh between
"stupid" and "silly"

He is rather stilly.

# *Stroop effect*

**disregard all information except color**

The Stroop effect is a demonstration of interference in the reaction time of a task. When a word such as blue, green, red, etc. is printed in a color differing from the color expressed by the word's semantic meaning (e.g. the word "red" printed in blue ink), a delay occurs in the processing of the word's color, leading to slower reaction times and an increase in mistakes.

# *Stroop effect*

**Say aloud as fast as possible
the <span style="color:red">color</span> of each word**

| Group 1 | green | red | blue | yellow | blue | yellow |
|---------|-------|-----|------|--------|------|--------|
| Group 2 | green | red | blue | yellow | blue | yellow |

If naming the first group of colors is easier and quicker than the second, then your performance exhibits the Stroop effect.

# Errors when trying to put words in the right order

(syntax + morphology)

# Generation of syntactic structure

1. **Idea**$_1$ : (a) Students buy beer.
2. **Idea**$_2$ : (b) Beer comes from different places.

These two ideas can be expressed independantly as here above or as an embedded clause, ('b' occuring inside of 'a'), yielding

Beer, students buy, comes from many different places.

# Generation of syntactic structure

Perfectly correct and quite understandable, but things can change quickly. Imagine that a similar situation occurs at the very moment of producing the word 'students'. The speaker wishing to integrate :

<p style="color:green; text-align:center">Policemen follow the students.</p>

Again, many languages allow us to integrate all this information into a single sentence, yielding something like :

[Beer$_1$, [students$_2$, [policemen$_3$ follow$_3$], buy$_2$], comes$_1$ from many different places].

# Generation of syntactic structure

1. While being **grammatically correct** there are various **problems**, some only potential, others more real, problems that will become more serious as the *number of embeddings* grows.

2. First of all, **embeddings** affects the *listener*. Indeed, this kind of sentence is hard to understand (in particular if the links between the subject and the predicate are not predictable), as the listener has to store a list of subjets (beer, students, policemen), which she links then in inverse order (LIFO) to their corresponding predicates (follow, buy, come).

# Generation of syntactic structure

This being said, this kind of structure, called *centerembedding*, may also end up becoming a problem for the **speaker**, as he must not only make sure to produce the respective predicates in the correct order (beer-come-many places; students-buy-beer; policemen-follow-students), but also produce then the appropriate agreements.

Yet, in this particular setting (beer$_{sing}$, students$_{plural}$, policemen$_{plural}$) chances are that the speaker makes an **agreement error**, to produce the plural form 'come' instead of the singular 'comes'.

# Generation of syntactic structure

This is not a **mistake**, the speaker knows the rule. It is an **error** having various possible causes :

- lack of attention, i.e. divided attention, not tightly controlled allocation of resources (book-keeping);
- short-term memory constraints (overload) and
- priming : all but the first noun in the chain are in *plural*, making the speaker forget to pay attention, i.e. to remember the number of the subject of the main clause ("beer comes from many different countries."), which is in *singular*.

**Success**

learning

**Action**

learning

**Failure**
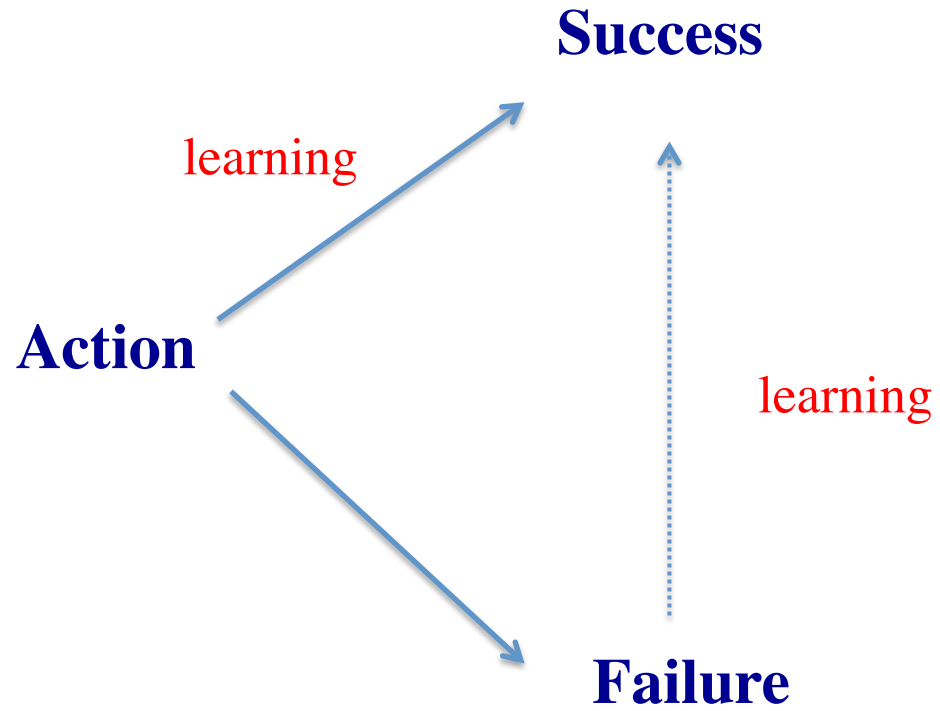
# Learning by imitation
# Success by chance
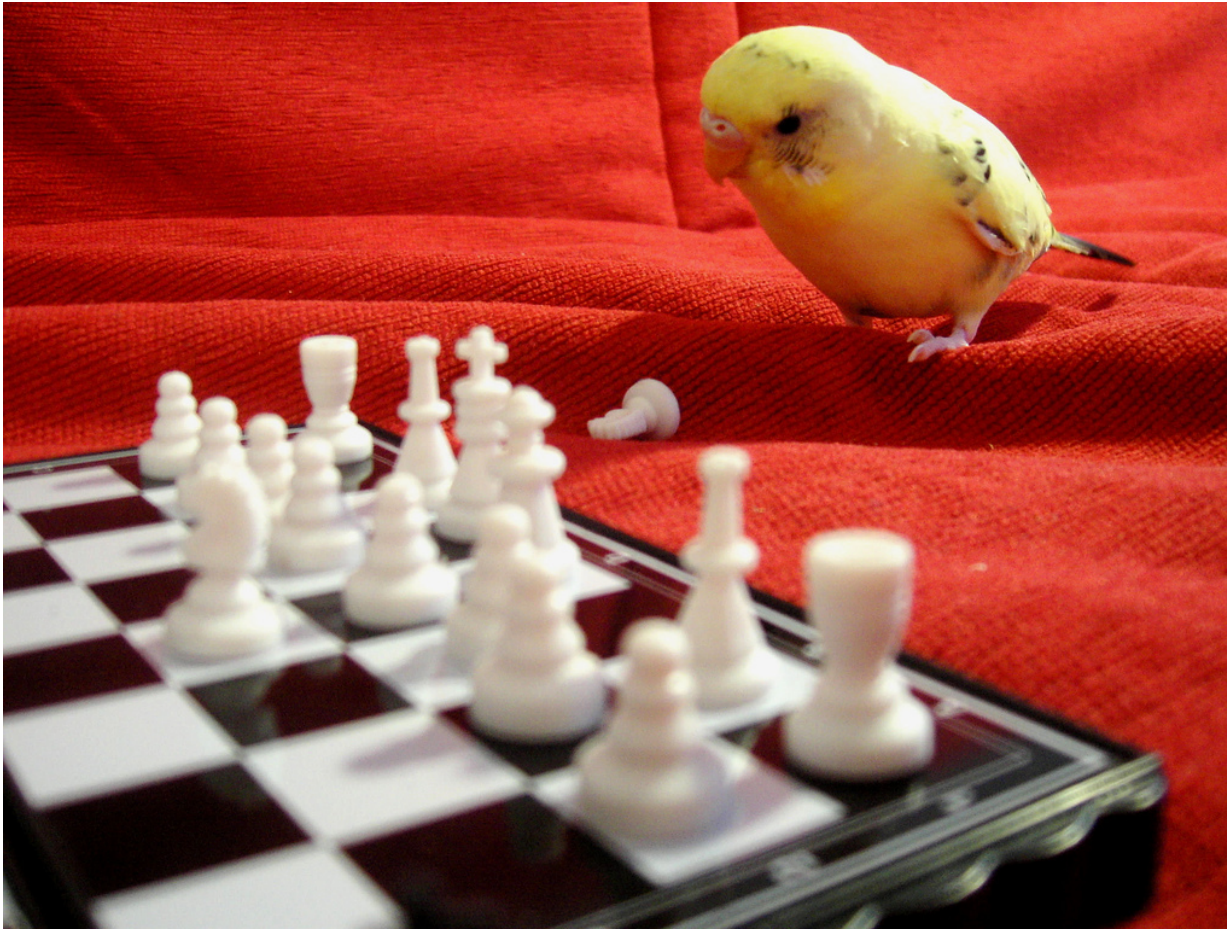


He won, but he doesn't have the faintest clue why

# True knowledge

## 1. Generativity

▶ Be able to produce similar outputs (specific case, class)

## 2. Transfert

▶ Be able to transfer the knowledge to similar situations

## 3. Usage

▶ Know when and how to use it

# Conclusion

Errors are a necessary evil of learning and progress. Being unavoidable for learning and processing of language in realtime, they are also a gateway or window to the mind. Hence they are precious information for teachers, researchers and language practitioners (speakers) alike.

Put differently, rather than being only a form of nuisance, errors can be considered as a valuable (and exploitable) resource. They allow us not only to shed light on the mental processes, but also identify the needs and cognitive states of the language producer, which is precious information for those who want to explain the process, help its acquisition (trachers) or wish to build the needed tools (engineers).

# Conclusion

While errors should be avoided to begin with, there is no foolproof way for doing so. In addition this strategy may turn out to be counterproductive (stress, inducing silence, minimal risk taking, ...). Since there is no way to eradicate them, it seems wiser to accept them and to learn how to recover from them if ever they do occur. One of my goals in this talk has been to show how this can be achieved.

# Thanks for hanging in!

Just two more talks before hanging out!