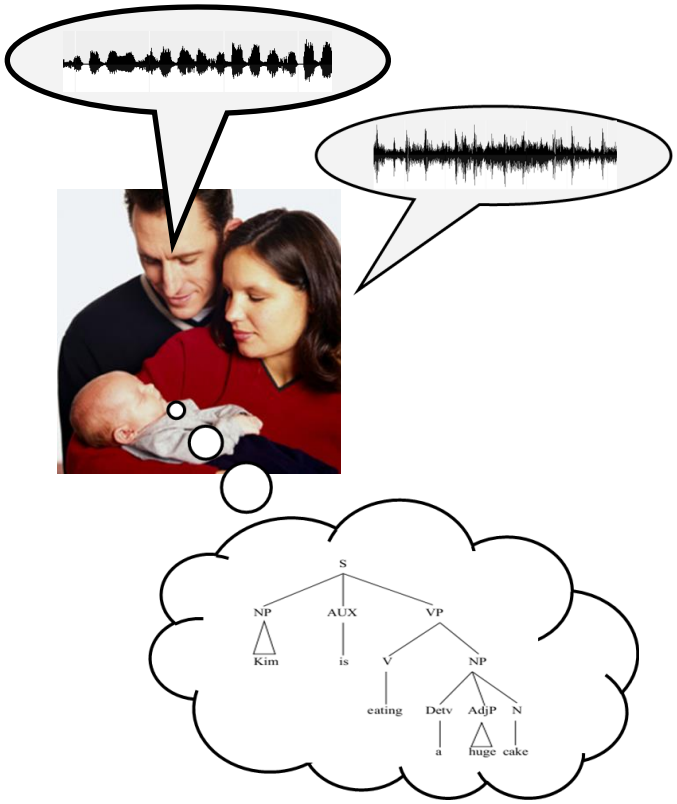
Theories of First Language Acquisition



Lecture 2

Froso Argyri

First Language acquisition

- **Language acquisition:** the study of the processes through which humans acquire language.

- **First language acquisition:** studies infants' acquisition of their native language.

First Language Acquisition

- Language is extremely complex

- Before the age of 5 young children know most of the grammatical rules of their language system: they have the capacity to produce and understand a limitless number of sentences

First Language Acquisition

- Adults are no more aware of the phonological, morphological, syntactic, and semantic rules than are the children.

- Do you remember anyone telling you to form a sentence by adding a verb phrase to a noun phrase?

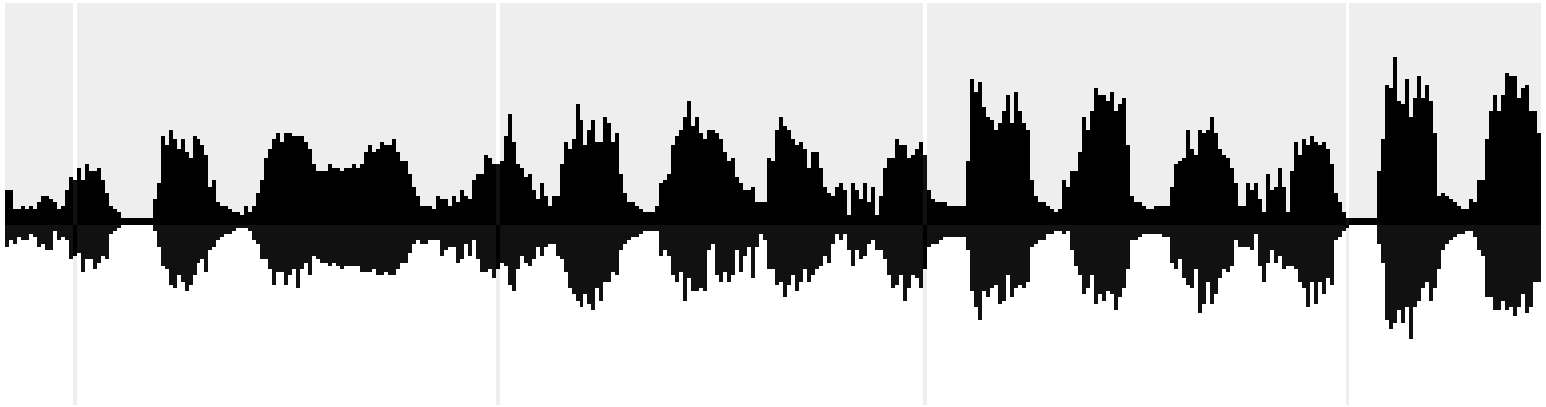
- All children construct grammar effortlessly from the language they hear around them

  Actively involved in developing their language.

The poverty of the stimulus

- Children receive no direct information about structure

Children don’t get told that English is a subject-verb-object language, or that the past tense is formed by adding -ed.



The induction problem

- An infinite number of possible underlying grammars

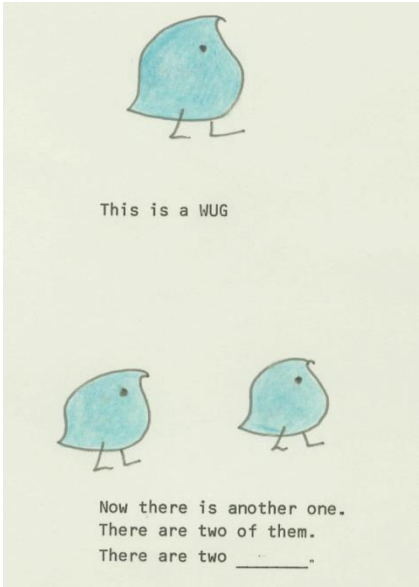
(a) *The boy is tall.*
(a') *Is the boy _ tall?*
→ Front words starting with /i/
→ Front first auxiliary
→ Front main clause auxiliary
→ …

The induction problem

- The child as a linguist: What are the arbitrary constraints of a particular structure?
- Sample of impoverished data.

Yet, infants learn language

- going beyond the input
  - the *wug*-test (Jean Berko Gleason, 1958)
  - young children have extracted generalizable rules from the language around them, rather than simply memorizing words that they have heard



Yet, infants learn language

- **under variable input conditions**
  - monolinguals vs. bilinguals
  - deaf and hard of hearing infants (Petitto, 2001)
  - blind infants (Landau & Gleitman, 1985)

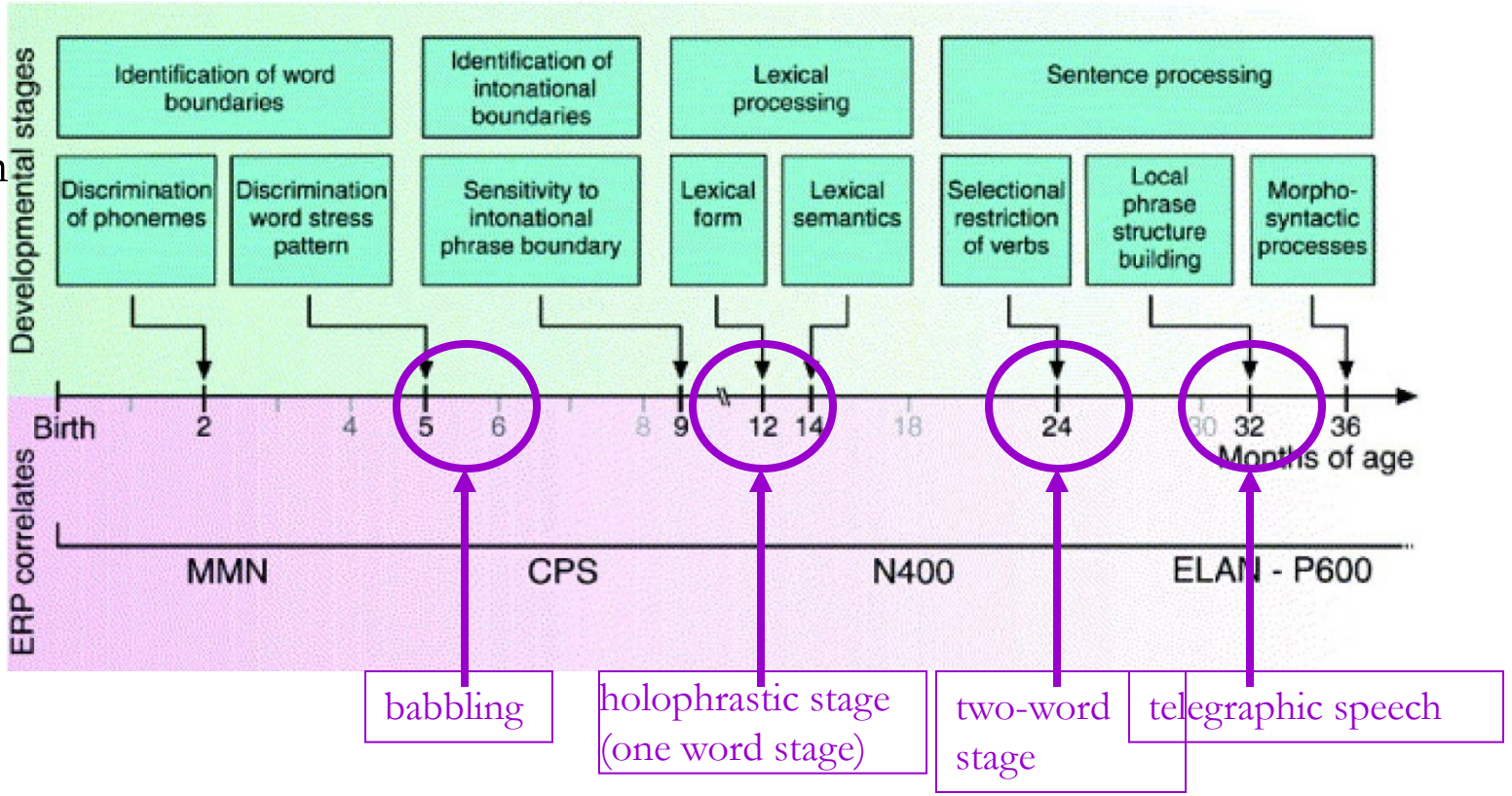
Yet, infants learn language

- following a uniform developmental path (Friederici 2004)

perception

electro-physiology

production



Characteristics of language acquisition

- Most children acquire language with comparative ease.
- Language acquisition is rapid.
- Children make few errors (when you think of all the logically possible errors they could make).
- Explicit teaching by parents is not necessary.
- Children pass through the same sequence of steps in language development.

How do children acquire language?

- Various proposals that describe the mechanisms involved in language acquisition
- Early theories: influenced by behaviourism
- Behaviourism: focus on people's directly observable behaviours vs. the mental systems underlying these behaviours.
- Language: a kind of verbal behaviour
- Behaviourist principles: imitation, reinforcement, analogy, and similar processes.

How do children acquire language?

- B. F. Skinner (1957): proposed a model of language acquisition in his book '*Verbal Behaviour'*.
- N. Chomsky (1959): Reply to Skinner 'Rev*iew of Verbal Behaviour'* .
- Main proposal: Language could not be acquired by behaviourist principles; Alternative: innate knowledge (Universal Grammar)

Empiricism vs. mentalism.

How do children acquire language?

A. Imitation?

B. Corrections, teaching & reinforcement?

C. .. analogy?

D. What is the role of child directed speech/motherese/parentese?

E. Is there an innate capacity for language?

Do children learn through imitation?

Child: My teacher holded the baby rabbits and we patted them.

Adult: Did you say your teacher held the baby rabbits?

Child: Yes.

Adult: What did you say she did?

Child: She holded the baby rabbits and we patted them.

Adult: Did you say she held them tightly?

Child: No, she holded them loosely.

Children are quite reluctant to be corrected.

Fromkin et. al. (2011)

Do children learn through imitation?

- Don't children just listen to the language heard around them and imitate the speech they hear?

- Imitation is probably involved in some aspects of language acquisition

e.g. naming, greetings, formulaic utterances;

but not others e.g. development of morphosyntax

Do children learn through imitation?

- Early child utterances: not simply imitation of the adult speech.
- Adults do not say words like *holded* or *foots* or sentences such as *two foot; Mommy get it my ladder; cowboy did fighting me;*

Fromkin et. al. (2011)

Do children learn through imitation?

- Children seem to be unable to produce sentences outside of the rules of their developing grammar.

- A child's attempt to imitate what the adult has said:

adult: He's going out.
child: He go out.
adult: That's an old-time train.
child: Old-time train.
adult: Adam, say what I say. Where can I put them?
child: Where I can put them?

Do children learn through correction and reinforcement?

Double negative.

Child: Nobody don't like me.
Mother: No, say "Nobody likes me."
Child: Nobody don't like me.
(dialogue repeated eight times)
Mother: Now, listen carefully; say "Nobody likes me."
Child: Oh, nobody don't likes me.

Negative reinforcement does not make the child conform in this instance.

ANONYMOUS MOTHER AND CHILD (Fromkin et. al. 2011)

Do children learn through correction and reinforcement?

- Behaviourism: children learn to produce correct sentences because they are positively reinforced when they say something grammatical and negatively reinforced (corrected) when they say something ungrammatical.

- Not exactly though…

Do children learn through correction and reinforcement?

- Roger Brown and his colleagues (Harvard University) studied parent–child interactions.

- Findings:

- Correction seldom occurs
- Some corrections: mispronunciations or incorrect reporting of facts BUT not for "ungrammatical utterances."
- Example: the ungrammatical sentence "*Her curl my hair*" was not corrected, the child's mother was curling her hair.

Do children learn through correction and reinforcement?

However: when the child uttered "*Walt Disney comes on Tuesday*," she was corrected: the television program was shown on Wednesday

Do children learn through correction and reinforcement?

- Brown concludes:

It is “truth value rather than syntactic well-formedness that chiefly governs explicit verbal reinforcement by parents—which renders mildly paradoxical the fact that the usual product of such a training schedule is an adult whose speech is highly grammatical but not notably truthful.”

Do children learn through correction and reinforcement?

- Adults will sometimes **recast** children's utterances into an adultlike form, as in the following examples:

Child	**Mother**
It fall.	It fell?
Where is them?	They're at home.
It doing dancing.	It's dancing, yes.

- What does the mother do? Recasts may possibly be helpful to the child BUT they are not used consistently.

Do children learn through correction and reinforcement?

- Study of 40 mothers of children 2-4 years old: 25% of children's ungrammatical sentences are recast

- Grammatical sentences were recast as often as bad sentences.

- Parents allow many ungrammatical utterances uncorrected and change many grammatical utterances: tendency to focus on the content rather than the structure/grammar of the sentence

- Confusing for the child to rely on recasts

Do children learn through correction and reinforcement?

- Parental corrections: How or what children learn from such adult responses? How children discover and construct the correct rules?
- Children are not aware of what they are doing wrong
- Children cannot make corrections even when they are asked to

Do children learn through correction and reinforcement?

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.
father: Say . . . “other.”
child: Other.
father: Spoon.
child: Spoon.
father: Other . . . spoon.
child: Other . . . spoon. Now give me other one spoon?

Fromkin et. al. (2011)

Do children learn through correction and reinforcement?

- Such conversations between parents and children do not occur often
- Mothers and fathers usually find such mistakes cute and amusing

Do children learn through analogy?

- Children put words together to form phrases and sentences by **analogy:** they hear a sentence and use it as a model to form other sentences.

Do children learn through analogy?

- Lila Gleitman:

Suppose the child has heard the sentence "I painted a red barn." So now, by analogy, the child can say "I painted a blue barn." That's exactly the kind of theory that we want. You hear a sample and you extend it to all of the new cases by similarity. . . . In addition to "I painted a red barn" you might also hear the sentence "I painted a barn red." So it looks as if you take those last two words and switch their order. . . . So now you want to extend this to the case of seeing, because you want to look at barns instead of paint them. So you have heard, "I saw a red barn." Now you try (by analogy) a . . . new sentence—"I saw a barn red." Something's gone wrong. This is an analogy, but the analogy didn't work. It's not a sentence of English.

Do children learn through analogy?

The child hears another pair of sentences:

The boy was sleeping. Was the boy sleeping?

- Based on pairs of sentences like this, he formulates a rule for forming questions: was the boy

"Move the auxiliary to the position preceding the subject."

- He then acquires the more complex relative clause construction:

The boy who is sleeping is dreaming about a new car.

-He now wants to form a question. What does he do?

If he forms a question on analogy to the simple yes-no question, he will move the first auxiliary *is* as follows:

**Is the boy who sleeping is dreaming about a new car?*

Do children learn through analogy?

- Studies of spontaneous speech and experiments: children never make such mistakes.
- Syntactic rules (e.g. the rule that moves the auxiliary) are sensitive to the structure of the sentence and not to the linear order of words.

Connectionism

- **Connectionism**: a computer model of language acquisition; behaviourist learning principles: analogy and reinforcement.

- Grammatical rules are stored nowhere: Linguistic knowledge, e.g. knowledge of the past tense, is represented by a set of neuron-like connections between different phonological forms (e.g., between *play* and *played*, *drink* and *drank*).

- Repeated and frequent exposure to particular verb pairs reinforces the connection between them: mimicking rule-like behaviour.

- Based on word-similarities, the model can produce a past-tense form: On analogy to *dance-danced*, it will convert *prance* to *pranced*; on analogy to *drink-drank* it will convert *sink* to *sank*.

Connectionism

Problems with **connectionism**

a. The model: language input has very specific properties; BUT input investigation shows that this is not the case.

b. Rules, e.g. formation of plurals cannot be based only on phonological; plural formation should also be sensitive to information in the lexicon.

For example, when an irregular plural is part of a larger noun, it may be regularized: several images of Walt Disney's Mickey Mouse are usually described as **Mickey Mouses**, not **Mickey Mice**.

Child-directed speech

- Adults do not address the little creature as if they are involved in normal adult-to-adult conversation.

- There does seem to be a lot of this:

Oh, goody, now Daddy push choo-choo?

- ‘Motherese’ or ‘child-directed speech’

Child-directed speech

- This simplified speech style is characterised by:
  - Simplified lexicon
  - Higher pitch/extra loudness
  - Exaggerated intonation
  - Slower tempo with longer pauses
  - Simple sentences
  - Frequent use of questions (Mother) & imperatives (Father)

Child-directed speech

MOTHER: *Look!*
CHILD: (touches pictures)
MOTHER: *What are those?*
CHILD: (vocalizes a babble string and smiles)
MOTHER: *Yes, there are rabbits.*
CHILD: (vocalizes, smiles, looks up at mother)
MOTHER: (laughs) *Yes, rabbit*.
CHILD: (vocalizes, smiles)
MOTHER: *Yes*. (laughs)

Brunner (1983)

What is the role of child-directed speech?

- What about the role of **motherese** or **child-directed speech** (CDS)?
- Claim: Emphasis on the role of environmental input in facilitating child language acquisition.

- Motherese is not syntactically simpler, it includes:
  - Syntactically complex sentences such as questions (*Do you want your juice now?*)
  - Embedded sentences (*Mommy thinks you should sleep now*)
  - Imperatives (*Pat the dog gently!*)
  - Negatives with tag questions (*We don't want to hurt him, do we?*).

What is the role of child-directed speech?

- What about the role of **motherese** or **child-directed speech** (CDS)?
- Claim: Emphasis on the role of environmental input in facilitating child language acquisition.

- Motherese is not syntactically simpler, it includes:
  - Syntactically complex sentences such as questions (*Do you want your juice now?*)
  - Embedded sentences (*Mommy thinks you should sleep now*)
  - Imperatives (*Pat the dog gently!*)
  - Negatives with tag questions (*We don't want to hurt him, do we?*).

What is the role of child-directed speech?

- Although infants prefer to listen to motherese over normal adult speech, studies show that using motherese does not significantly affect the child's language development.

What is the role of chid-directed speech?

This is a very Western phenomenon.

- Not all cultures use a special style of language with children; in some cultures adults do not talk to babies frequently.
- Adults adjust their language to the child's increasing linguistic sophistication.
- Exaggerated intonation and other characteristics of motherese may be useful for getting a child's attention and for reassuring the child.
- CDS is not a driving force behind language development.
- Analogy, imitation, and reinforcement cannot account for language development: they assume that what the child acquires is a set of sentences or forms rather than a set of grammatical rules.

Do children learn through structured input?

- The aforementioned proposals cannot explain:

a. the creativity that children show in acquiring language
b. why they go through stages
c. why they make some kinds of "errors" but not others, e.g. "*Give me other one spoon*" but not "*Is the boy who sleeping is dreaming about a new car?*"

A very influential alternative proposal: Children construct Grammars

We are designed to walk. . . . That we are taught to walk is impossible. And pretty much the same is true of language. Nobody is taught language. In fact you can't prevent the child from learning it.

NOAM CHOMSKY, The Human Language Series program 2, 1994

Children construct Grammars

Language acquisition: creative.

- No explicit information is provided about the rules, by either instruction or correction: children extract the grammatical rules from the language they hear around them
- Developmental stages are similar, possibly universal irrespective of socioeconomic and cultural background.
- Even deaf children of deaf signing parents go through developmental stages that resemble those of children acquiring spoken languages.

Children construct Grammars

Proposal: Children are born with an innate template or blueprint for language, called Universal Grammar (UG).

- This blueprint helps children in the task of constructing a grammar for their language →**Innateness hypothesis**.

Children construct Grammars

Poverty of the stimulus argument for the innateness of UG: We end up knowing far more about language than is exemplified in the language we hear around us.

- Children hear many utterances but the language input they are exposed is incomplete, noisy, and unstructured.
- CDS is well formed, but children are also exposed to adult–adult interactions: slips of the tongue, false starts, ungrammatical and incomplete sentences.

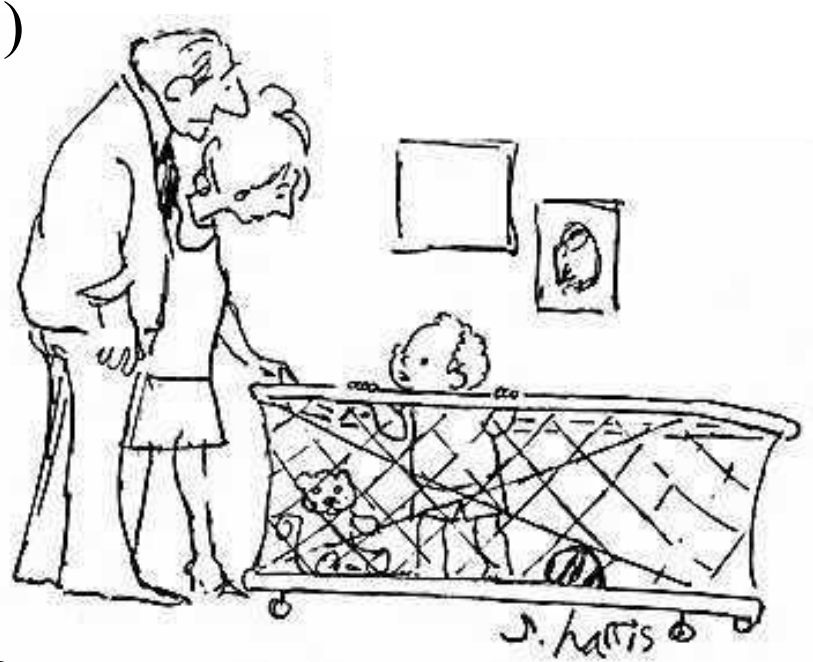
Children construct Grammars

Children come to know aspects of the grammar about which they receive *no* information.

- Therefore, the input children are exposed to is **impoverished:** less than what is expected to explain the richness and complexity of the grammar they attain.

Universal Grammar (Chomsky 1959)

- innate, biologically endowed
- P&P model (Chomsky 1981)
  - *principles*:
    - categories (N/V)
  - *parameters*:
- word order (VO/OV)
  - English: write a letter
  - Japanese: tegami-o kaita
    letter wrote



"WHAT'S THE BIG SURPRISE? ALL THE LATEST THEORIES OF LINGUISTICS SAY WE'RE BORN WITH THE INNATE CAPACITY FOR GENERATING SENTENCES."

Children construct Grammars

The child must also learn many aspects of grammar from her linguistic environment.

- English-speaking children: English is SVO language.
- Japanese children: Japanese is an SOV language.

The innateness hypothesis

- Extraction from the linguistic environment of language-specific grammatical rules, such as word order and movement rules.
- Children do not need to learn universal principles, e.g. about sentence formation: heads of categories can take complements.
- These principles are part of UG that children use to construct the grammar of their own language.

Innateness hypothesis

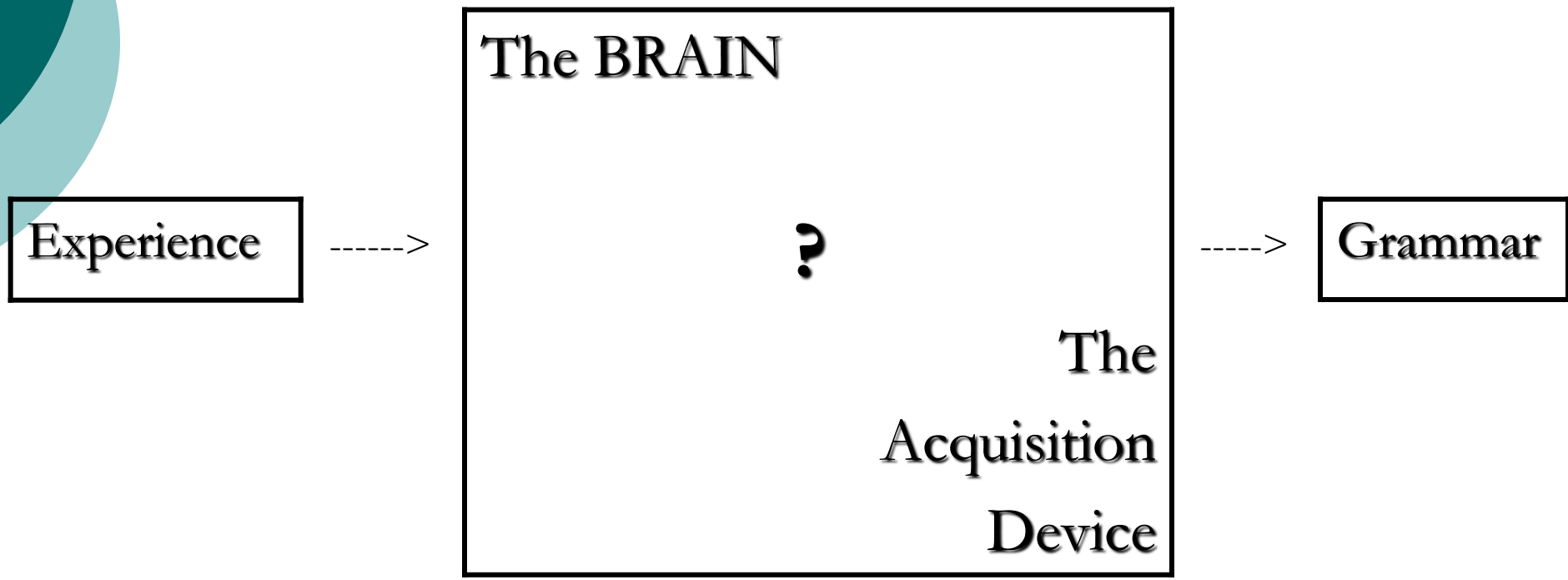
- Innateness hypothesis: answers *the logical problem of language acquisition* posed by Chomsky:

What accounts for the ease, rapidity, and uniformity of language acquisition in the face of impoverished data?

- **ANSWER**: children acquire a complex grammar quickly and effortlessly because UG provides them with a significant head start.

- UG helps children to extract the rules of their language and to avoid many grammatical errors.

The Acquisition Device



The acquisition device is language specific devoted to acquisition.

- Consists of an inborn grammar (UG) i.e. grammatical categories & principles common to all languages.

- Q: 'That child is misbehaving' – how does the child figure out that 'child' is a N and 'misbehaving' a V?

Answer: UG offers 'clues' e.g. words referring to concrete things are Ns – eventually children figure out by exposure & experience other properties of Ns (e.g. Ns follow articles or locatives and can become plural by adding 's – process known as 'bootstrapping').

2. The acquisition device is NOT just specialised for language (e.g. Bloom 2002)

e.g. learning names of things is just an example of a general sort of reasoning

e.g. (i) I show my son 2 animals – a bear (familiar object) and a yak (unfamiliar) a general sort of reasoning may be put into operation:

a. I know that that object is called ‘a bear’
b. If Mummy had meant to refer to the bear she would have said bear
c. But she didn’t – she used a new word called ‘yak’
d. So she must intend that other object.
e. So ‘yak’ must refer to the other object.

(ii) Experiment by Disendruck & Markson (cited in Bloom 2002) – illustrating reasoning.

Which theoretical account is right?

- Difficult to assess as supporters of the different views concentrate on different evidence & they don't agree on the representation of syntactic categories & structures.

- Division:
  a. linguists who view language as highly complex formal system – best described by abstract rules – no other counterparts in areas of cognition (acquisition device is language specific);

- b. linguists who consider language in terms of communicative function i.e. strategies that facilitate communication & determine how it works – tend towards a multipurpose acquisition device.

Learning strategies

Regardless of the nature of the acquisition device there is still a lot to be learned – how do children do this?

- Generalisations: drawing a general conclusion from specific cases (powerful learning tool)– with in-built restrictions & control (i.e. make small generalizations; don't overgeneralize)
- 'Be conservative': Children avoid producing word orders they do not hear
- Example: dogs, cats, books→ -s can be added to a noun to indicate 'more than one'; walked, played→ -ed can be added to a verb to form past tense

Learning strategies

- ‘Principle of contrast’ (O’Grady 2005)

  “Every two forms contrast in meaning” – no two words should have exactly the same meaning/function e.g. ‘quickly’ vs. ‘fast’

- Repeated exposure (with the help of recasts: partial repetitions of children’s utterances) may be helpful for the child to notice the difference between an immature form in her speech, e.g. *eated* vs. *ate*, the adult form. (O’Grady 2005).

Summary

- Children are not taught language; they extract the rules from the ambient language.

- Imitations of adult speech, reinforcement, and analogy cannot explain:

a. How children creatively form new sentences according to the rules of their language.
b. Why children make certain kinds of errors but not others.

Summary

- Empirical studies of the motherese hypothesis: grammar development does not depend on structured input.
- Ease, rapidity & uniformity of children's language acquisition, despite the **poverty of the stimulus** they receive: innate language faculty, i.e. the infant comes to the complex task already endowed with a Universal Grammar.
- UG is not a grammar like the grammar of English or Arabic: principles to which all human languages conform.
- Children create grammars based on the linguistic input and are guided by UG.

Summary

- Although there is general agreement that there is a ‘language acquisition device’ there is still controversy surrounding the nature of it.

- Regardless of the nature of the acquisition device there are a number of learning strategies children employ in the acquisition of language.

Concepts Introduced

- Imitation
- Reinforcement
- Behaviourism
- Innateness Hypothesis
- Language Acquisition Device
- Child-directed speech/Motherese
- Universal grammar
- Poverty of the stimulus
- Analogy
- Connectionism

Documentary on child language development

- Language Development. No 6 in the Discovering Psychology series, a telecourse hosted by Philip Zimbardo and available from PBS:

- http://www.learner.org/discoveringpsychology/index.html