

ELN101: Intro to Bilingualism
Week 8 Second Language Acquisition

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Announcements this week

- Assignment deadlines are always on Sundays
- Paper 1 due on Sunday, November 8, 2026
- Quiz 2

Our Primary Question in Language Acquisition (1)

- Why do children learn language so consistently, effortlessly, and universally (while almost all adults fail to learn a new language like a native speaker)?
- In this class, we will examine the innativist perspective (i.e., the Critical Period Hypothesis).
- However, watch or read these at your leisure:
  - How to learn any language in six months (5 Principles and 7 Actions; a TEDTalk by Chris Lonsdale) https://youtu.be/d0yGdNEWdn0
  - Why We Struggle Learning Languages (Gabriel Wyner, the author of *Fluent Forever*) (https://youtu.be/iBMfg4WkKL8)
  - The Mystery of People Who Speak Dozens of Languages in the New Yorker (https://t-nagano.link/saCGE)

Utterances by Second Language Speakers (1)

Familiarity check

- We will play audio recordings of speakers of English as a second language.
- Identify their country of origin. Choose from the following options.

• India	• Argentina	• Japan
• South Korea	• Germany	• Mexico
• Italy	• China (Hunan)	• Iran

1. Practice 1: _____
2. Speaker 2: _____
3. Speaker 3: _____
4. Speaker 4: _____
5. Speaker 5: _____
6. Speaker 6: _____
7. Speaker 7: _____
8. Speaker 8: _____
9. Speaker 9: _____
10. Speaker 10: _____

Utterances by Second Language Speakers (2)

1. New York City (Queens)
2. Karnataka, India
3. South Korea
4. Treviso, Italy
5. Cordoba, Argentina
6. Heidelberg, Germany
7. Hunan Province, China
8. Japan
9. Mexico City, Mexico
10. Tehran, Iran

Utterances by Second Language Speakers (3)

- Why do we speak a second language with an accent or use non-native grammar?



Neurolinguistics

- The study of the relationship between language and the brain.

- The case of Phineas P. Gage: In 1848, near Cavendish, Vermont, a construction foreman had an accident in which a three-and-a-half-foot-long tamping rod pierced his head (from the upper cheek to the front top of his forehead). Despite severe and seemingly fatal damage to the frontal area of his brain, Phineas Gage recovered without any observable loss of language ability.



- The case of Phineas P. Gage

  The Phineas Gage's example suggests that the brain localizes different skills into different areas. (so, the frontal area of the brain seems to have nothing to do with the language abilities). Where are the language abilities located?

- Watch *The Unxplained*: https://t-nagano.link/a5SuU
- Watch Jill Bolte Taylor's TED talk: https://t-nagano.link/dGnox

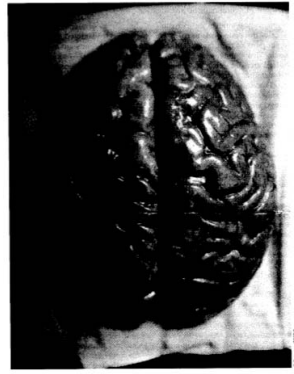


Figure 2.2 The human brain viewed from above. The physical appearance of the human brain does not reveal what the brain does or how it does it. The field of neurolinguistics is devoted to the study of what structures in the brain are involved in language processing and language acquisition and how those structures serve their linguistic functions.

Broca's area

The front part of the left hemisphere (right in front of the left ear) is considered to be associated with syntax (or the production skills, more generally)

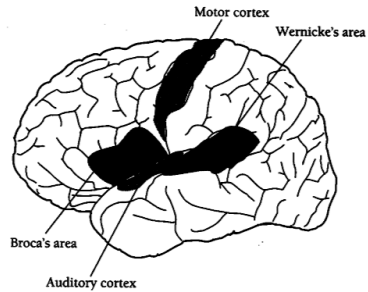


Figure 2.5 Language areas of the brain

Wernicke's area

The back part of the left hemisphere (right behind the left ear) is considered to be associated with semantics (the comprehension skills, more generally)

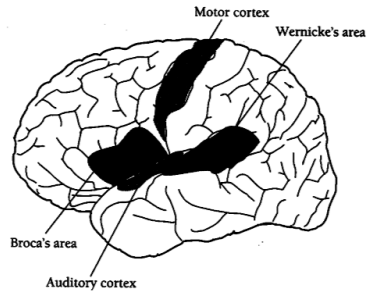


Figure 2.5 Language areas of the brain

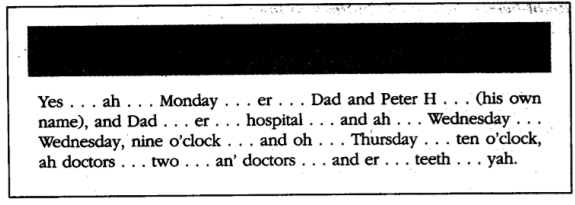
Aphasia

Aphasia is the impairment of language function due to localized brain damage, which leads to difficulty in understanding or producing language forms. Aphasia is commonly caused by a stroke, traumatic head injuries in the war and accidents.

- Broca's aphasia
- Wernicke's aphasia

Broca's aphasia

- a substantially reduced amount of speech
- disordered articulation
- slow and effortful speech
- consists of only lexical morphemes (nouns, verbs, adjectives etc.)
- frequent omissions of functional items (determiners, 3ps -s etc.)



Yes . . . ah . . . Monday . . . er . . . Dad and Peter H . . . (his own name), and Dad . . . er . . . hospital . . . and ah . . . Wednesday . . . Wednesday, nine o'clock . . . and oh . . . Thursday . . . ten o'clock, ah doctors . . . two . . . an' doctors . . . and er . . . teeth . . . yah.

Source: From Goodglass, 1979, p. 256.

Wernicke's aphasia

- produce very fluent speech
- difficult to make sense of because the words are too general

Box 2.3 Example of speech produced by a patient with Wernicke's aphasia

The patient is responding to the question, "How are you today?": "I feel very well. My hearing, writing been doing well. Things that I couldn't hear from. In other words, I used to be able to work cigarettes I didn't know how . . . Chesterfeela, for 20 years I can write it."

Source: From Goodglass, 1993, p. 86.

Aphasia and language development (4)

- Watch these video clips of the stroke survivors. Which types of aphasia do they suffer?
  - Broca's aphasia
  - Wernicke's aphasia

- https://youtu.be/cJ6OvHq9WrQ: _____
- https://youtu.be/3oef68YabD0: _____
- https://youtu.be/6zNKz7YoUao: _____
- https://youtu.be/PFFr5TFtgII: _____

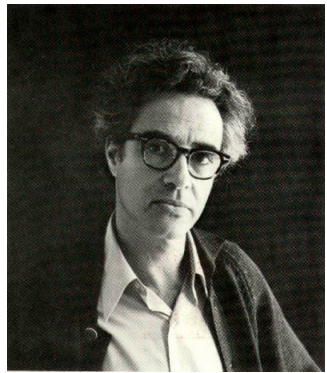
Aphasia and language development (5)

- Sarah Scott suffered a stroke at 18 years old, which resulted in Broca's aphasia. She is videotaping her speech every year to raise awareness of young-age aphasia. (see https://t-nagano.link/bunFN)

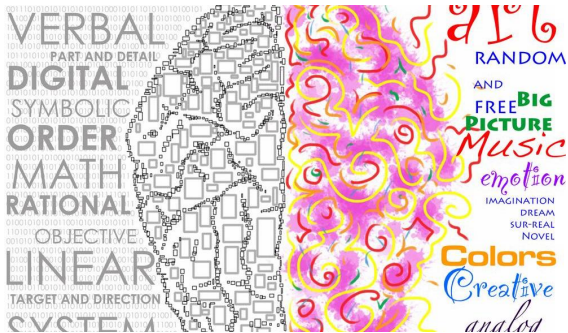


Aphasia and language development (6)

- Eric Lenneberg (1967) noted that young children with major hemisphere lesions or hemispherectomies developed language normally. → Why is there such a large difference between childhood and adult aphasia?

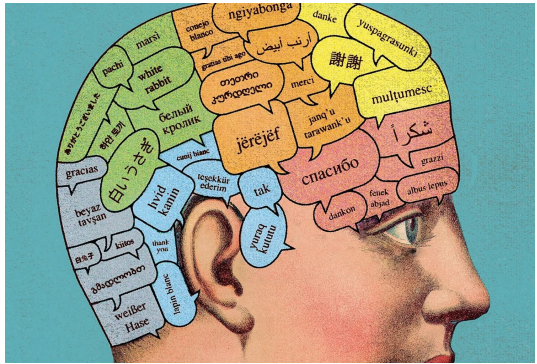


- The cases of aphasia patients show that different language functions (syntax/grammar and semantics/meaning) are controlled by the different areas in the brain.



Neurolinguistic research methods (1)

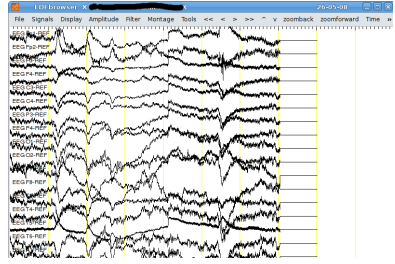
- Lenneberg's findings about the relationship between brain development (lateralization) and language development date from the 1960s. More recent neurolinguistic research uses different methods.



The brain imaging techniques: EEG

Electroencephalography (EEG) is the recording of electrical activity (voltage fluctuations) along the scalp

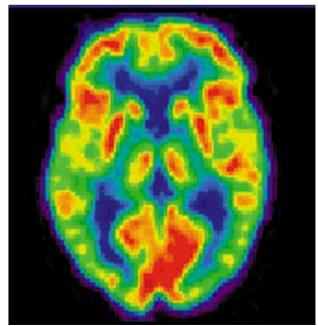




The brain imaging techniques: PET

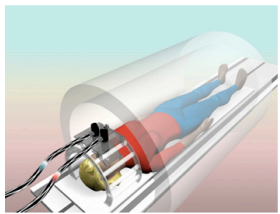
Position Emission Tomography (PET scan) shows a brain image through the low-level radioactive gas or glucose with a radioactive substance.



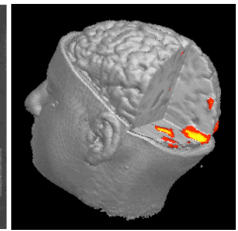


The brain imaging techniques: MRI & fMRI

(functional) Magnetic Resonance Imaging (MRI & fMRI) captures the image of activities in the brain that result from patterns of blood flow and oxygen consumption. (but, see https://t-nagano.link/wlUHP for a possible issue of research using fMRI.)







Neurolinguistic research methods (5)



Localization of the brain functions

The majority of research suggest that specific aspects of language functions are localized in different parts of the brain.

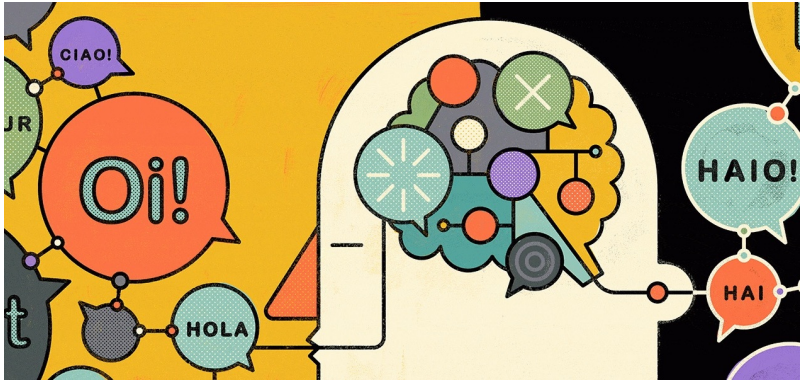
Critical Period Hypothesis (CPH)

- From the clinical data, Lenneberg (1967) hypothesized that brain lateralization is completed at puberty. Before puberty, children's brains have not yet assigned specialized functions to different areas. The CPH argues that language specialization will occur only if a child is exposed to appropriate linguistic input before lateralization.
- First language acquisition should be triggered within a biologically determined window in life (that is, before puberty).

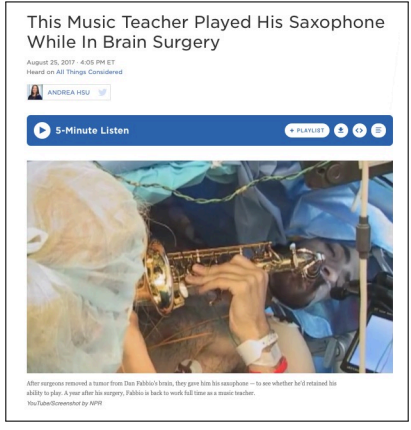
Second Language Acquisition Theories (2)

- The Critical Period Hypothesis is an intuitively attractive hypothesis. It is commonly thought that
  - Children acquire language very fast, flawlessly, and effortlessly.
  - Adults have a hard time learning a second language and may never attain the fluency of a child learner.
- The CPH claims that the language acquisition should take place before puberty. (but see the New Yorker article on hyperpolyglots at https://t-nagano.link/JuAqt)

- Do you agree with the Critical Period Hypothesis? Why or why not?



- We have learnt a lot about how the human brain works, but we still know so little about it. (Dan Fabbio's brain surgery; https://t-nagano.link/KxHoQ)



Second Language Acquisition Theories

- **Critical Period Hypothesis / Fundamentally Different Hypothesis**
  A theory arguing that language acquisition will never happen after the critical period (roughly at the age of 10-13 or puberty) $\rightarrow$ A second language learner never becomes like a native speaker

- **UG (Universal Grammar) full-access hypothesis**
  A theory arguing that second language acquisition is fundamentally the same as the first language acquisition $\rightarrow$ A second language learner eventually becomes like a native speaker

- Expected learning time for English speakers (from the Foreign Service Institute of the US Department of State (Jackson and Kaplan1999))

LANGUAGE CATEGORIES	WEEKS	HOURS
Category I: Languages closely cognate with English: *French, German, Italian, Portuguese, Romanian, Spanish, Swedish, Dutch, Norwegian, Afrikaans, etc.*	23-24	575-600
Category II: Languages with significant linguistic and/or cultural differences from English: *Albanian, Amharic, Azerbaijani, Bulgarian, Finnish, Greek, Hebrew, Hindi, Hungarian, Icelandic, Khmer, Latvian, Nepali, Polish, Russian, Serbian, Tagalog, Thai, Turkish, Urdu, Vietnamese, Zulu, etc.*	44	1100
Category III: Languages that are exceptionally difficult for native English: *Arabic, Chinese, Japanese, and Korean*	88	2200

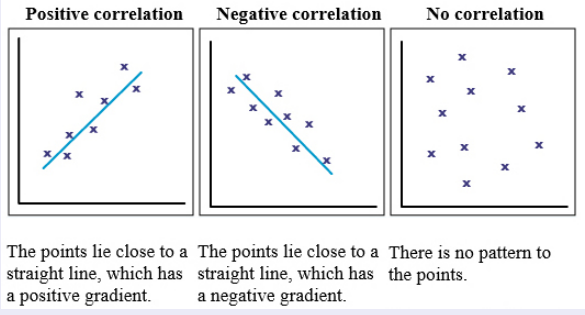
Second Language Acquisition Theories (7)

- What are the factors that differentiate SLA from FLA?
  - Cognitive maturity (e.g., intelligence and memory)
  - Metalinguistic awareness
  - World knowledge
  - Anxiety about speaking
  - Time pressure
  - Corrections on grammar and pronunciation
  - Corrections on meaning (e.g., word choice)
  - Personality (e.g., introvert vs. extrovert)
  - Interlocutor and his/her language
  - Identity and ethnic group affiliation

- Some of the differences typically associated with SLA may not be true.

Quick introduction to/refresher of correlation

- **Correlation**: A statistical measure of the linear relationship between two quantitative variables.



Correlation and Causation (2)

- Examples of positive correlations
  - The amount of time studying & class grades
  - Distance from Manhattan & commuting time
  - Age & health problems
  - Years of education (high school, college, graduate school etc) & income
  - The version of iPhone (iPhone 6, 7, 8, X etc) & its price
- Examples of negative correlations
  - The amount of time studying & the amount of time sleeping
  - Distance from Times Square & rent
  - Age & the amount of hair
  - The number of flu shots given in a neighborhood & the number of flu patients in the same area
  - The version of iPhone (iPhone 6, 7, 8, X etc) & attractiveness
- What will be correlated with the following variables?
  - money in your wallet
  - delays on the MTA
  - today's temperature
  - number of beers consumed

- Influence of Age
  - Johnson & Newport tested English proficiency attained by 46 native Korean or Chinese speakers who had arrived in the United States between the ages of 3 and 39 (**?**)
  - English proficiency is measured with 12 basic English rules such as
    - Omission of past-tense morpheme *-ed*, plural morpheme *-s*, irregular morpheme etc. (e.g., **The farmer bought two pig at the market*)
    - Case (e.g., **Susan is making some cookies for we*)
    - Auxiliary verb (e.g., **Fred will be get a raise next month*)
    - Yes-no question (e.g., **Can ride the little girl a bicycle?*)
    - etc...

- Influence of Age: A strong negative correlation between age of arrival (especially before/after puberty) and English proficiency

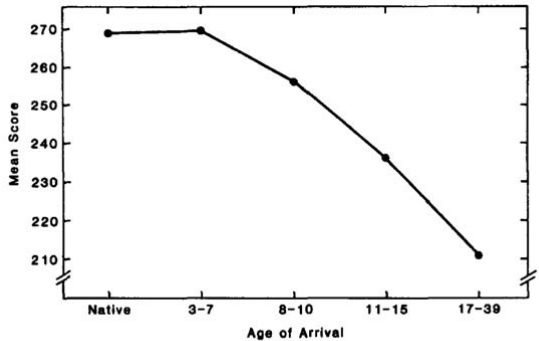
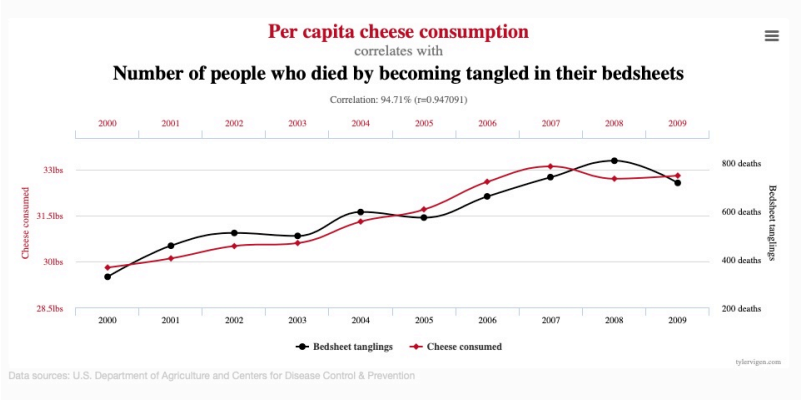
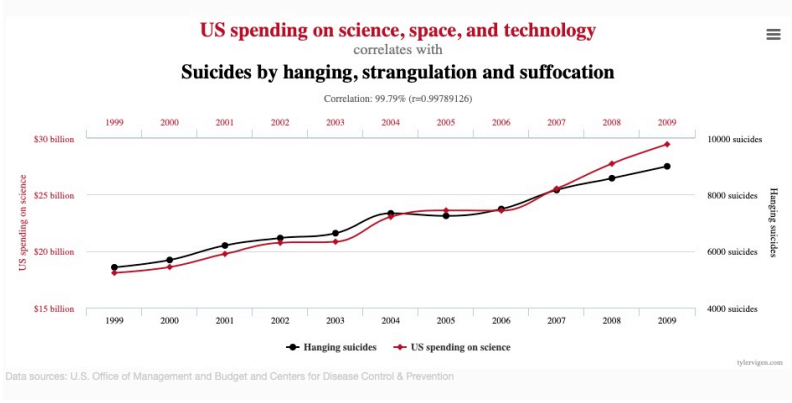


FIG. 1. The relationship between age of arrival in the United States and total score correct on the test of English grammar.

- Correlations only indicate two independent phenomena are related; they do not promise any cause and effect relationship between the two variables (see Vigen (2015))



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Correlation and Causation (7)

US spending on science, space, and technology correlates	↔	Suicides by hanging, strangulation and suffocation
Number of people who drowned by falling into a pool correlates	↔	Films Nicolas Cage appeared in
Per capita cheese consumption correlates	↔	Number of people who died with tangled bedsheets
Divorce rate in Maine correlates	↔	Per capita consumption of margarine
Age of Miss America correlates	↔	Murders by steam, hot vapours and hot objects
Total revenue generated by arcades correlates	↔	Computer science doctorates awarded in the US
Worldwide non-commercial space launches correlates	↔	Sociology doctorates awarded (US)
Per capita consumption of mozzarella cheese correlates	↔	Civil engineering doctorates awarded
People who drowned after falling out of a fishing boat correlates	↔	Marriage rate in Kentucky
US crude oil imports from Norway correlates	↔	Drivers killed in collision
Per capita consumption of chicken correlates	↔	Total US crude oil imports
Number people who drowned while in a swimming-pool correlates	↔	Power generated by US nuclear power plants
Japanese passenger cars sold in the US correlates	↔	Suicides by crashing of motor vehicle
Letters in Winning Word of Scripps National Spelling Bee correlates	↔	Number of people killed by venomous spiders
Math doctorates awarded correlates	↔	Uranium stored at US nuclear power plants

- How are these factors are correlated (or not correlated) with second language learning? If it is correlated, is it a positive correlation or negative correlation?

	Not correlated	Positive	Negative	Reason
Age			x	If kids arrive after age 8-15, their English grammar test score is significantly lower
Intelligence				
Memory				
World knowledge				
Metalinguistic awareness				
Anxiety about speaking				
Time pressure				
Corrections on grammar/pronunciation				
Corrections on meaning				
Personality (introvert)				
Personality (extrovert)				
Hearing simplified language				
Identity and ethnic group affiliation				

Ink-shedding (10 min)

1. What is the Critical Period Hypothesis?
2. Do you agree or disagree with it? Why?
3. Also, write at least one question that you wanted to ask during the class.

Bibliography (1)

Jackson, F. and Kaplan, M. A. (1999). Lessons learned from fifty years of theory and practice in government language teaching. In Altis, J. and Tan, A.-H., editors, *Proceedings of Georgetown University Round Table on Language and Linguistics*, pages 71–87, Washington, D.C. Georgetown University, Georgetown University Press.

Vigen, T. (2015). *Spurious Correlations*. Hachette Books, xxx, xxx.

This slide deck was created with LaTeX and the *beamer* class.