Second Language Acquisition and the Critical Period

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What we will do today

• Introduction to second language acquisition

• How age affects second language acquisition
Second language acquisition: a first look

- Classroom learning not the best example of L2 acquisition
- L2 acquisition is much like L1 acquisition
- Child L2 acquisition is especially like L1 acquisition
- Adult L2 acquisition diverges in certain ways from L1 acquisition
Classroom learning not the best example of L2 acquisition

• Majority of humans speak an L2; few of them learned it in classroom setting.
• Classroom language instruction is a relatively recent phenomenon.
• It usually involves just the beginning stages of acquisition.
A typical language class

3 hours per week
30 weeks per year
2 years of study
180 total hours of exposure
What can you do in 180 hours?

• If you learn 10 words per hour, you will learn 1,800 words in 2 years.

• Is this a lot?
You be the judge:
You be the judge:

1,800  two years of instruction
13,000  average 5-year-old
60,000  average 18-year-old
So…..

- Classroom language learning is worth studying (and worth doing!),

- But it is just one piece of the larger picture of second language acquisition.
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L2 acquisition is much like L1 acquisition

• Have to learn words: dog, run, of …
  – Typical error:
    “Cover the turkey with aluminum paper.”

• Have to learn rules: SVO, “add –ed to make verb past tense” …
  – Typical error:
    “I taked test yesterday.”
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Child L2 acquisition is especially like L1 acquisition

- After arriving in a new language environment, younger children will “catch up” within a year or two.

- They then appear to be indistinguishable from L1 acquirers of the language.
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- Pronunciation

- Inflectional morphology (grammatical endings on words):
  - “The boy walks to school.”

- Subtle semantic distinctions not present in L1:
  - “I saw a cow” vs. “I saw the cow”
  - “El niño corría mucho” vs. “el niño corrió mucho”
...but you already knowed this facts!
But many other aspects of adult L2 acquisition work just as you would expect…
Adults readily learn:

• Words (vocabulary)

• Word order and many other aspects of syntax: SVO, VSO, SOV, etc.

Neko-ga nezumi-o toraeru.
cat         mouse   catch
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Effects of age on L2 acquisition

- Critical period for L1 acquisition
- What would a critical period for L2 acquisition look like?
- Do we actually find such a critical period?
- Do late learners ever attain nativelikeness?
Critical period for L1 acquisition

- Critical period = “window of opportunity”
Standard evidence for critical period in L1

• Young infants are “universal listeners”. Ability declines around age 1.

• Delaying L1 acquisition until after childhood leads to low levels of grammatical development (e.g. Genie).
Effects of age on L2 acquisition

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What would a critical period for L2 acquisition look like?
What would a critical period for L2 acquisition look like?

- “Geometric features”
  - Heightened sensitivity at beginning
  - Clear point where offset (decline) begins
  - Flat period when critical period is over
What would a critical period for L2 acquisition look like?

- “Temporal features”
  - Heightened sensitivity through early childhood
  - Sensitivity bottoms out when full neurocognitive maturity is reached
  - Continued low sensitivity throughout adulthood
Effects of age on L2 acquisition

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Do we actually find such a critical period?

• The “classic” study says yes.
• Johnson & Newport (1989) compared English proficiency of Korean and Chinese immigrants to U.S.
• Age of arrival ranged from 3 to 39
• Length of residence in U.S. at least 3 years
• Subjects tested on variety of English structures
Results:

• Clear and strong advantage for early arrivals over late arrivals

• Age of arrival before puberty
  – Performance linearly related to age

• Age of arrival after puberty
  – Performance low but highly variable
  – Performance unrelated to age
But...

- Reanalysis of Johnson & Newport suggests that cutoff point is 20, not puberty
- Birdsong & Molis (2001) got different results:
Other studies point to same conclusion:

• Not clear there is sharp cutoff point

• Slow decline in sensitivity throughout life (i.e., no “flattening out”)
Flege (1999)

• Pronunciation of Italian immigrants to Ontario, Canada
• Length of residence $\geq$ 15 years
• No cutoff point where decline begins
• No flattening out in adulthood
Hakuta, Bialystok & Wiley (2003)

- Length of residence $\geq 10$ years
- 2.3 million responses
- No cutoff point where decline begins
- No flattening out in adulthood
English proficiency ratings: Chinese speakers

Native Chinese Speakers

English Proficiency

Age of Immigration

College
HS Grad
HS
< 8 Yrs Ed
< 5 Yrs Ed
English proficiency ratings: Spanish speakers

Native Spanish Speakers

English Proficiency

Age of Immigration

- College
- HS Grad
- HS
- < 8 Yrs Ed
- < 5 Yrs Ed
Key points from Hakuta, Bialystok & Wiley article

• “Our conclusion … is that second-language proficiency does in fact decline with increasing age of initial exposure.”

• “The pattern of decline, however, failed to produce the discontinuity that is the essential hallmark of a critical period.”

• “The degree of success in second-language acquisition steadily declines throughout the life span.”
Tentative conclusions

• Is there a sharp cutoff point where sensitivity begins to decline? NO
• Does sensitivity flatten out in adulthood? NO
• Is there a significant change in sensitivity when maturation is reached? NO
• Is there a well-defined critical period for L2 acquisition? NO

• Does age affect L2 acquisition? YES
Effects of age on L2 acquisition

• Critical period for L1 acquisition
• What would a critical period for L2 acquisition look like?
• Do we actually find such a critical period?
• Do late learners ever attain nativelikeness?
Do late learners ever attain nativelikeness?

• Previous assumed answer: Very rarely.
• Is what we would expect if there is critical period.
• Newer research reevaluates this, shows incidence of nativelikeness at 5% to 15%.
• This is additional evidence against critical period.
Comments on nativelikeness

• Not monolithic: one can be nativelike in pronunciation, but not syntax (or vice-versa).
• Have to consider the appropriate population: those who have had years of interaction with language.
• Incidence of nativelikeness appears to decline with age of arrival, as we would expect.
Final considerations

• Why does L2 learning ability decline throughout life?
  – Biology
  – Environment
Biology

• Age-related changes in cognitive processing.
• For example, decreasing ability to:
  – Learn paired associates.
  – Encode new information.
  – Recall detail as opposed to gist.
  – Perform “control” processes (e.g. Simon task)
Biology

• Also, general decline in:
  – Working memory capacity
  – Cognitive processing speed
  – Attention

These changes in brain functioning may account for much of the decline in language learning ability. But also …
Environment

- Lack of input that is good for learning.
- Need to respond in socially appropriate way.
- Insufficient time
Wanna learn another language?

- Would have been easier 10 years ago.
- But will be harder still 10 years from now.

So do it now.