

The Effects of Critical Period on English Learning: From the Aspect of Phonological Recognition

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Research Question

Question:
When should children
begin to learn English
as second language?

Hypothesis in Phonological Recognition:

During critical period

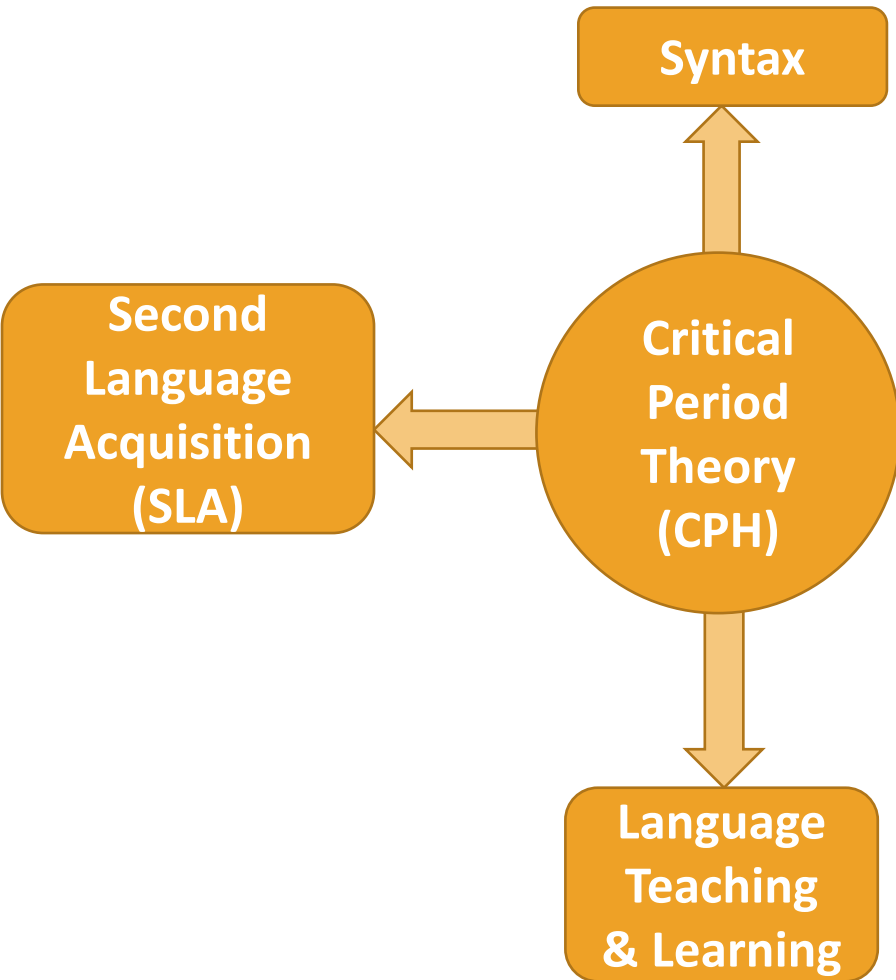
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After critical period

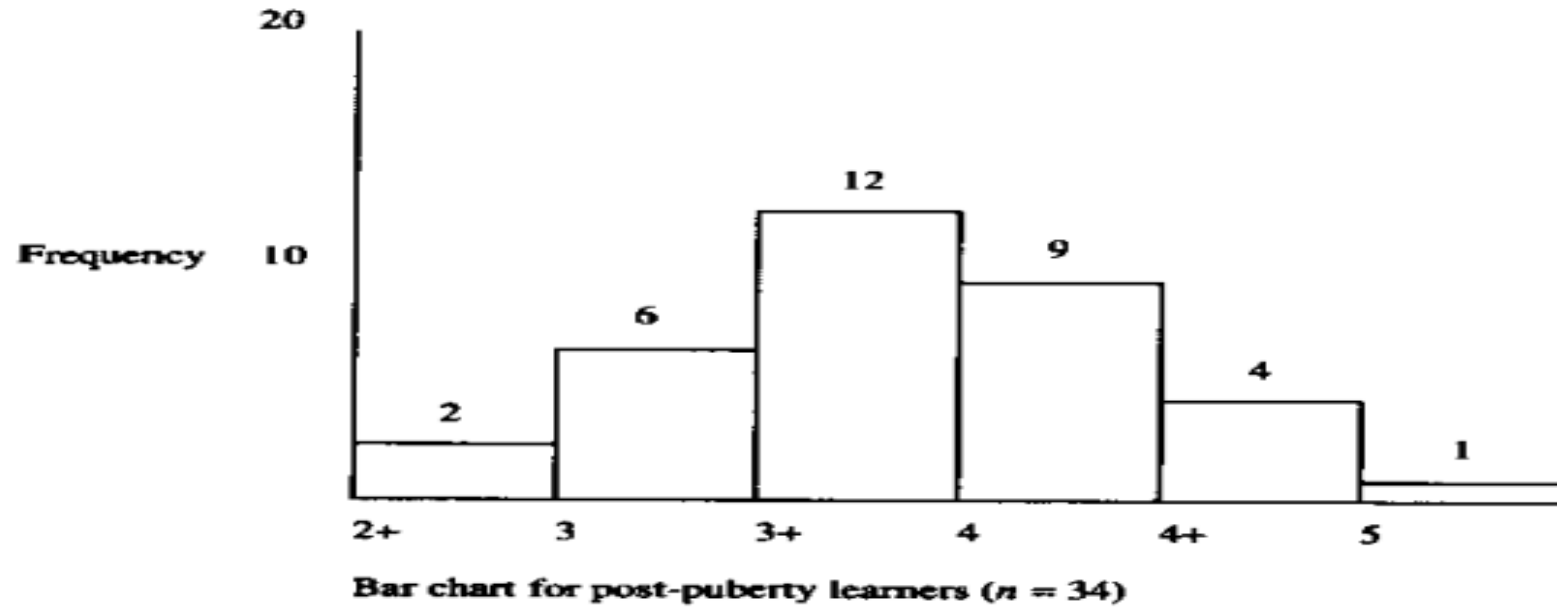
Infancy → Puberty → Adults



Significance



e.g. The bar chart below shows the syntax ratings for pre- and post- puberty learners:
(from Pastkowski 1980, p. 455)





Literature Review


Terminology

- **Aphasia**

- ◆ unable to comprehend and formulate language
- ◆ limited verbal output
- ◆ due to stroke/ head trauma

- **Cerebral Lateralization**

- ◆ two distinct cerebral hemispheres
- ◆ connected by the corpus callosum
- ◆ the macrostructure of the two hemispheres appears to be almost identical
- ◆ cognitive processes tend to be more dominant in one hemisphere than the other
- ◆ e.g. Broca's area



Critical Period Hypothesis (CPH) (Lenneberg, 1967)

- ◆ CPH was popularized by Eric Lenneberg in 1967 with *Biological Foundations of Language*.
- ◆ First language
 - relies on neuroplasticity.
 - If language acquisition does not occur by puberty, some aspects of language can be learned but full mastery cannot be achieved.
- ◆ Second Language
 - less widely accepted
 - older learners rarely achieve the native-like fluency
 - older often progressing faster than children in the initial stages
 - "younger = better in the long run"
 - pronunciation, or phonology, is mostly susceptible to CPH



The Duration of Critical Period in L2 Acquisition

- 1. **Lenneberg, E.** 1967 *Biological Foundation of Language*

Suggested that puberty was the stop-point of age for completely triumphant language acquisition, lasting from about age of **2 to puberty**

- 2. **Asher, J. & Garcia, R.** 1969 *The optimal age to learn a foreign language*

Found that the ages of **1-6** had the most native-like accent

- 3. **Johnson, J. S. & E. L. Newport** 1989 *Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language*

Revealed a negative relevance between the age of first exposure and grammatical proficiency and the age of **15** is immune from this phenomenon



Critical Period for L2 Acquisition

- **Asher & Garcia 1969**
- Aim: the relationship between early age of entering into the host country and successful acquisition of its language
- Results: none of the 71 Cuban was judged to have native-like pronunciation
BUT, the ages of **1-6** had the most native-like accent
- Conclusion: the earlier age of entry the country, the better acquisition of pronunciation (accent) on second language
- **Johnson & Newport 1989**
- Aim: to prove the existence of critical period for second language learning
- Result: subjects who began acquiring English in the United States at an earlier age obtained higher scores on the test of judging the grammaticality of many sentences and **after the age of 7**, the ability to learn a second language in syntax began to decline
- Conclusion: a correlation between the age of acquisition and the variance in the ultimate performance in adult



Critical Period for L2 Acquisition on Phonology

- 1. Diller, K. C. 1981

*Neurolinguistic clues to the essentials of a good language teaching methodology:
Comprehension, problem solving and meaningful practice*

From 6 years old to 8 years old

- 2. Scovel, T. 1998

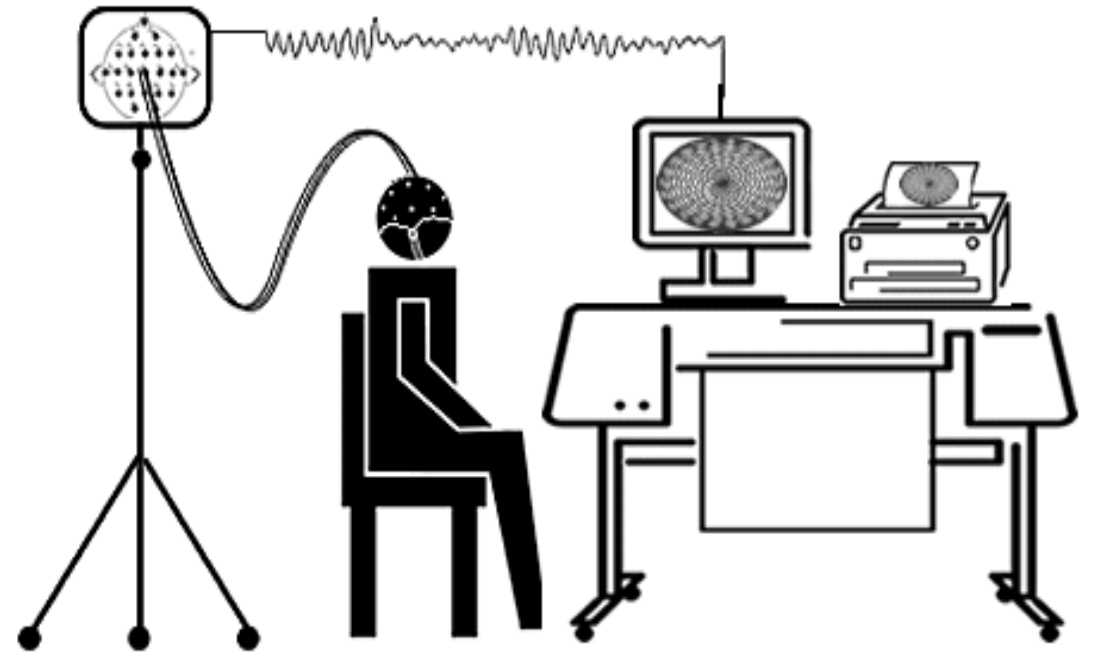
A Time to Speak: A Psycholinguistic Inquiry into the Critical Periods for Human Speech

Ended at around 12 years old

→ According to the previous studies, few studies pay attention to the phonological recognition on L2 acquisition. And thus, we aim to explore whether **the critical period on phonological recognition for L2 learners** is important in L2 acquisition.

Experiment Measurement

- ERPs
 - Measure participants' neural responses while they listen to the external stimuli (sound tracks)
 - Results will be analyzed by the computer



Participants

	Age (Begin to study English)	Learning length	Age (Now)	Mother tongue
Group A (50)	7	11	18	Chinese
Group B (50)	18	11	29	Chinese
Standard-Native speaker (50)	\	\	18-29	English

- Participants are mentally healthy without the barriers in hearing.
- Try to keep their background similar, e.g. no overseas experience, parents are native speakers of Chinese etc.



Procedures

Procedures	Errors Reduction
1. Arrange participants in a silent room	<ul style="list-style-type: none">• Lower the interference
2. Each of them will listen to the sound tracks with same volume	<ul style="list-style-type: none">• Ensure everyone can hear the sound tracks without variation
3. The 1 st attempt will be the demo only	<ul style="list-style-type: none">• To clarify every procedure• Avoid technical problems



Details

- A total of **5 sound tracks** will be played.
- Each track contains **10 words**.
- There is a consistent **pause time** between words.
- Participants will **not be told about the details** of the sound tracks beforehand.



Prediction

- Three sets of data from the native speaker, the participants from group A and B will be collected respectively.
- Compared with Group B , the ERP patterns of Group A will be much closer to native speaker.



Key References

- Asher, J. & Garcia, R. (1969). The optimal age to learn a foreign language. *Modern Language Forum*, 53(5): 334-41.
- Diller, K. C. (1981). Neurolinguistic clues to the essentials of a good language teaching methodology: Comprehension, problem solving and meaningful practice. In H. Winitz (ed.). *The Comprehension Approach to Foreign Language Teaching*. Rowley, MA: Newbury House Publishers: 141-153.
- Johnson, J. S. & E. L. Newport. (1989). Critical period effects in second language learning: The influence of maturational state on the acquisition of English as a second language. *Cognitive Psychology*, 21: 60-99.
- Lenneberg, E. (1967). *Biological Foundations of Language*. New York: John Wiley, pp. 173.
- Scovel, T. (1988). *A Time to Speak: A psycholinguistic Inquiry into the Critical Period for Human Speech*. New York, NY: Newbury House Publishers.