

人類學習

- 心理學基本學習原則
 - 行為學派
 - 認知建構論
- 以英語學習為例

行為學派 *Behaviorism* (1920-1960)

- Assumes that there are general laws of learning
- Learning is based on establishing associations
- Stimulus and response associations

Two related events:

Stimulus 1:
Lightning



+

Stimulus 2:
Thunder



Result after repetition:

Stimulus:
We see lightning



→

Response:
We wince,
anticipating
thunder



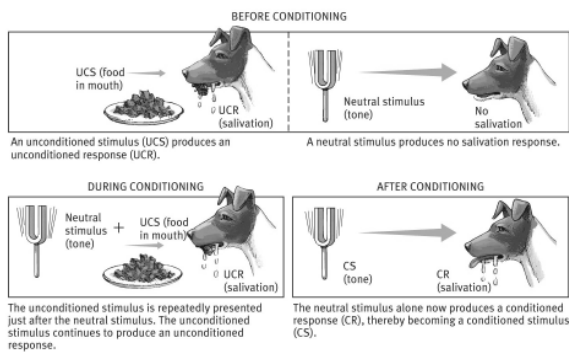
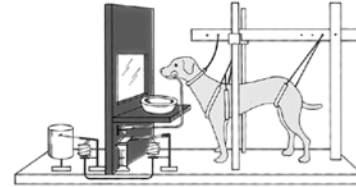
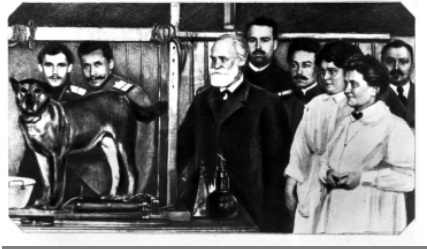
Behaviorist Theories

- Classical Conditioning
- Operant Conditioning

Classical Conditioning

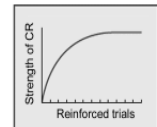
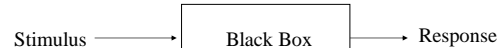
Ivan Pavlov
(1849-1946)

Ivan Pavlov Classical Conditioning 古典制約



Behavioral approach

只關心刺激跟反應連結。
變成教學則變成：老師良好示範、學生不斷練習。



認知建構論： 焦點人物Piaget

- Born in 1896 瑞士，十歲時，發表一篇麻雀白化症的文章於自然歷史期刊，後來青少年時期則研究軟體動物以及有殼動物，文章收藏於國家自然博物館期刊。
- 21歲，取得生物學博士學位。（Vygotsky同年生）
- 1920年時，接受Binet and Simon的研究室工作，編輯智力測驗，發現到幾件事情：
 - 1. 錯誤的答案比正確性更為重要，年長的人與年少者在智力上有著質上的不同。
 - 2. clinical method in studying intelligence and reasoning
 - 3. 研究邏輯，認為學童跟青少年時有所不同。
- 所以在理論中充滿生物學的概念。
- constructivism



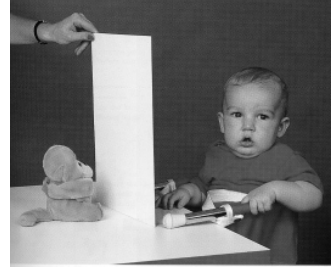
Piagetian concept	Definition	Example	
Start	Equilibrium	Harmony between one's schemes and one's experience.	Toddler who has never seen anything fly but birds thinks that all flying objects are "birdies."
	Assimilation	Tries to adapt to new experience by interpreting it in terms of existing schemes.	Seeing an airplane in the sky prompts child to call the flying object a birdie.
	Accommodation	Modifies existing schemes to better account for puzzling new experience.	Toddler experiences conflict or disequilibrium upon noticing that the new birdie has no feathers and doesn't flap its wings. Concludes it is not a bird and invents a new name for it (or asks, "What dat?"). Successful accommodation restores equilibrium—for the moment, at least.
Finish	Organization	Rearranges existing schemes into new and more complex structures.	Forms hierarchical scheme consisting of a superordinate class (flying objects) and two subordinate classes (birdies and airplanes).

Note: As an exercise, you may wish to apply Piaget's concepts to chart the further elaborations of the child's schemes upon encountering a butterfly and a frisbee.

stages

- Sensorimotor stage
 - 0-24 months
 - object permanence 物體恆存
- preoperational stage
 - 2-7 yrs
 - conservation 保留概念
- concrete operational stage
 - 7-11 yrs
 - Concrete thinking
- formal operational stage
 - more than 11 yrs
 - abstract thinking

Object permanence



Preoperational stage 前運演期基本現象

- conservation 保留概念
 - number, length, liquid, weight.....
- Egocentrism and animism
 - three mountains problem, 甚至到6-7歲選自己方向圖片。
 - perspective taking

CONSERVATION TASK	STEP 1	STEP 2
Number	<p>"Are there the same number or a different number?"</p>	<p>"Now watch what I do." (Spreading) "Are there the same number or a different number?"</p>
Length	<p>"Are they the same length or a different length?"</p>	<p>"Now watch what I do." (Moving) "Are they the same length or a different length?"</p>
Liquid quantity	<p>"Do they have the same amount of water or a different amount?"</p>	<p>"Now watch what I do." (Pouring) "Do they have the same amount of water or a different amount?"</p>

Area	<p>"Do each of these two cows have the same amount of grass to eat?"</p>	<p>"Now watch what I do." (Spreading) "Now does each cow have the same amount of grass to eat, or does one cow have more?"</p>
Volume	<p>"Does the water level rise equally in each glass when the two balls of clay are dropped in the water?"</p>	<p>"Now watch what I do." (Removing one ball of clay from water and reshaping) "Now will the water levels rise equally, or will one rise more?"</p>

characters of concrete operational stage

- Only think in concrete information they perceived directly

皮亞傑與教育

- 建構主義 constructionism, constructivism
- active learner
- cognitive stage
- cognitive challenge
- individual difference

- 建構數學
 - 目的：
 - 現在的問題
 - 建構教學法

- 學生為中心：學習者的認知結構與訊息處理。
- 形成異例，挑戰認知平衡，促使轉移到現一個階段。

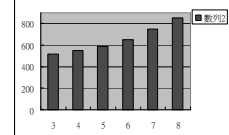
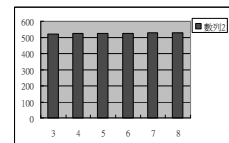
How does a Taiwanese recognize English words?

- Whole word approach? (visual->semantic)
- Phonological decoding? (visual->orthographic/phonological->semantic)

■Ting Ting Chang, MS thesis

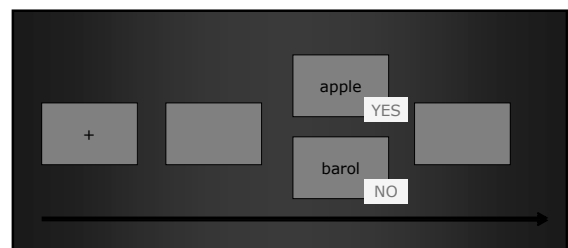
Parallel or Serial?

- To explore the word recognition processes by Examining word length effect
 - Locus: Letter /phoneme/syllable?



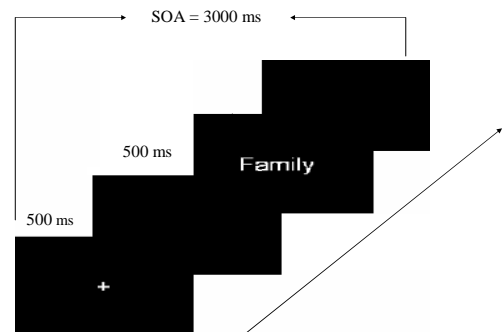
- Words
- Pseudowords (dit, pik, strack)
- Consonant strings/nonwords (ftdl, qrsl)

Lexical decision task

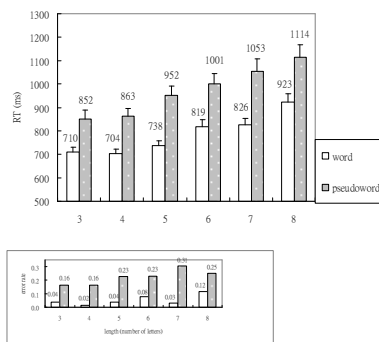


- Aim of the experiment
 - To examine word length effect of EFL learners
- Subjects
 - 24 EFL native speakers of Chinese
- Design
 - 2(word/pseudoword) * 6(length 3~8 letters) within-subject design
- Materials
 - 84 high familiar words (3~8 letters) ex. bus
 - 84 pseudowords (3~8 letters) ex. dit
- Procedures
 - LDT (Lexical decision Task) paradigm

Procedures



Pseudowords as No responses



基本議題

- 雙語者，認知上有優點嗎？
- 第二語言學習。
 - 語言學習的關鍵期。
 - 語言的大腦神經機制。
 - 語言學習與記憶。
- 是不是要急著送小孩學英文？
- 全語文學校有效否？
- 圖像、右腦記憶對語文有效否？

Being Bilingual Boosts Brain Power ?

- 研究者發現，在控制年齡以及教育程度下，雙語使用者在語言區域的灰質，比單語者多。Nature (2004) Andrea Mechelli et.al.
- 美國早期移民研究，認為雙語者在許多認知發展的能力上比單語者要差，但是，後來，這樣的論證並不受到新的證據支持。甚至，越來越多研究發現雙語可能產生思考的彈性。

- 第一語言不需要“學”(learned)，好像是經由一些語言互動接觸就習得(acquired)了。
 - 語言的特性：產生性(generative)，非模仿(imitation)
 - Overgeneralization:
 - Go, goed, goed (go, went, gone)
 - 不可能以背誦的方式學好。
 - 鸚鵡學說話，動物學語言。

L2學習

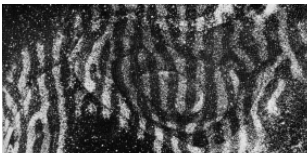
- 學習者年齡的問題。
 - 關鍵期假說。

學習的關鍵期假說

- 一般的廣告詞。
 - 零到三歲決定一生
 - 長大了才學英文，一定學不好。
- 關鍵期
 - 錯過了人生早期的一段時間學習，就幾乎不可能學會。
- 敏感期
 - 過了人生早期的一段時間學習，就比較難學會。

關鍵期假說(critical period)

- 銘印現象(imprinting)
 - Lorenz。
- 視覺剝奪
- 動物研究
- 被動物收養的小孩(Feral children)
- 個人經驗



Hubel and Wiesel



birdsong



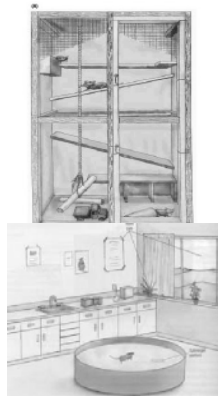
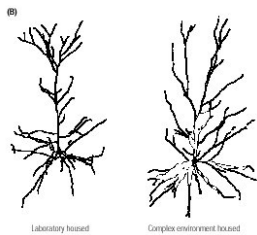
Feral children

- Genie, 13yrs, 語言發展有限
- Isabelle, 6.5yrs, 八歲已經能夠達一般水準。

- 很多人因此怕(小孩)輸在起跑點。或甚至是沒有起跑機會。
- 這些的內容，加上大腦與學習的相關研究被擴張解釋，就更令人煩惱。

環境與大腦發育

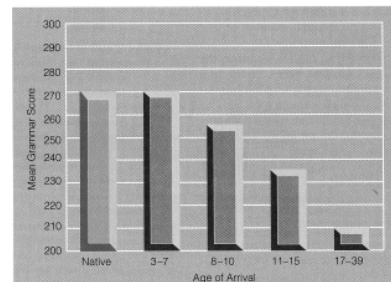
- Greenough



- 經驗可以預期的學習(視覺、語言功能)。
- 經驗依賴的學習(如動作、閱讀、計算)。
- 如果某種能力真的跟生存息息相關，以生物系統的特性而言，不可能要學。
 - 鳥學築巢、魚學游泳？
- 應該要注意的，是生物系統的特性，根據生物系統的限制，作學習的規劃。
 - 天性與教養，商周出版社。

- 以ESL為例。
- 第二語言學習有關鍵期嗎？

支持的證據：Johnson and Newport 1989 移民美國的年齡與第二語言發展

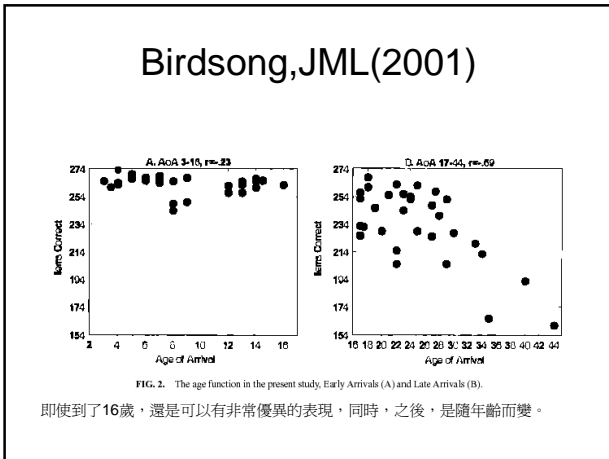
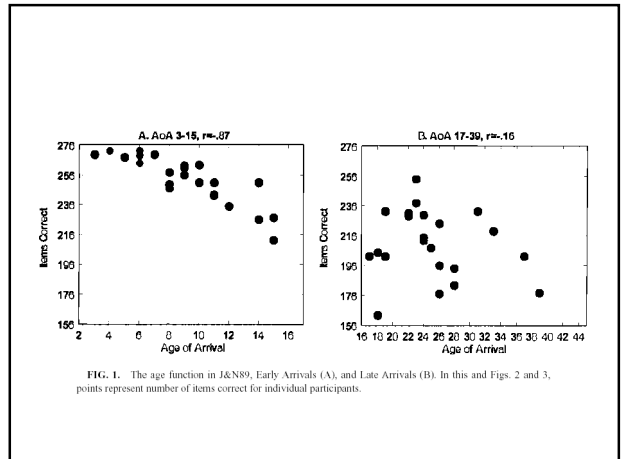


3-7 歲與native speaker相同，15歲是明顯界線。

Number and Examples of the Nine GJT Sentence Types

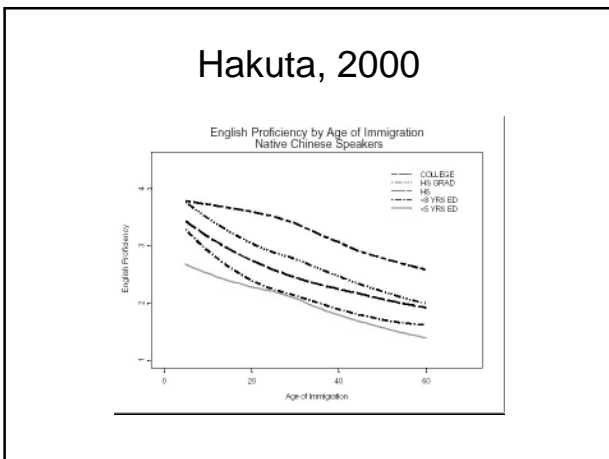
N	Sentence type	Examples
8	Past tense	A policeman gave Alan a ticket for speeding yesterday. *A policeman gave Alan a ticket for speeding yesterday.
8	Plural	Todd has many coats in his closet. *Todd has many coat in his closet.
8	Third-person singular	Every Friday our neighbor washes her car. *Every Friday our neighbor wash her car.
8	Determiners	The boy is helping the man build a house. *The boy is helping the man build house.
8	Pronouns	Susan is making some cookies for us. *Susan is making some cookies for we.
6	Particle movement	Kevin called up Nancy for a date. *Kevin called Nancy for a date up.
14	Subcategorization	The little boys laughed at the clown. *The little boys laughed the clown.
4	Lexically specified subject/object raising	Larry believed himself to be brave. *Larry believed that himself to be brave.
4	Y/N questions	Should Timothy have gone to the party? *Should have Timothy gone to the party?
4	Wh questions	Where did she put the book? *Why did she put the book?

Note. N, the number of sentence pairs. In the list of examples, the ungrammatical member of each sentence pair is marked by an asterisk.



反對的證據

- 主要證據：
 - 到底關鍵期在什麼時候？
 - 3/6/10/18？
 - 並不是過了關鍵期就不行。
 - 在英語國家接受正式教育年數，顯示關鍵期並沒有那麼關鍵。



Flege et.al. 1999

TABLE 7

Comparisons of Two Groups of 20 Native Korean Participants Each Who Differed in Amount of Education in the United States but Were Matched for AOA

Outcome variable	More years of education	Fewer years of education	F(1,38)
Foreign accent	5.0 (1.8)	5.0 (2.0)	0.00
Overall GJT score	87% (8)	80% (14)	3.29
Lexicon based GJT	84% (13)	79% (18)	1.39
Rule based GJT	93% (4)	85% (12)	9.15*

Note. The two groups differed significantly in U.S. education (8.9 vs. 15.1 years) but had the same AOA (12.3 years for both groups). Standard deviations are in parentheses. *P < .01.

控制到美國年齡，但是不同教育程度

TABLE 8

Comparisons of Two Groups of 20 Native Korean Participants Each Who Differed in AOA but Were Matched for Amount of Education in the United States

Outcome variable	Earlier AOA	Later AOA	F(1,38)
Foreign accent	5.2(2.1)	3.6(1.4)	8.22*
Overall GJT score	83% (13)	81% (9)	0.24
Lexicon based GJT	81% (17)	78% (12)	0.39
Rule based GJT	87% (11)	89% (8)	0.43

Note. The two groups differed in AOA (9.7 vs. 16.2 years) but had the same number of years of education in the United States (10.8 years). Standard deviations are in parentheses. *P < .01.

控制教育年限後，僅腔調有影響

TABLE 9
Comparisons of Two Groups of 20 Native Korean Participants Each Who Differed in Self-Reported Language Use but Were Matched for AOA

Outcome variable	Little	Much	F(1,38)
	L1/much L2	L1/little L2	
Foreign accent	5.6 (1.7)	4.4 (1.9)	4.27*
Overall GJT score	89% (10)	83% (12)	2.45
Lexicon based GJT	89% (12)	80% (15)	4.14*
Rule based GJT	92% (8)	88% (11)	1.32

Note. The two groups differed significantly in self-reported Korean use (4.1 vs. 2.1) but were matched for AOA (11.4 years). Standard deviations are in parentheses. * $P < .05$.

控制AOA，但是語言使用的差異。

- 請注意這些研究的條件，都是在國家、學校、媒體語言環境都是英文L2，社區以及家庭語言環境可能是L1的情形。
- 台灣大概只有幾年前的閩南語有類似的語言環境。想想看你的英語語言環境？
– 這幾期時代雜誌的封面新聞是什麼？

- 基本上，沒有關鍵期，但早學比晚學好。即使是早學比較好，也在某些條件下是對的，但是，台灣並沒有那種條件。
- 在美國，談論的雙語學習，指的是社區以及家庭使用非英語的語言但是在學校，以及一般社會環境中，優勢語言是英語。儘管都是在學英文，這與台灣的英文環境，是截然不同的。
- 不管結論為何，要想清楚背景條件的不同。研究的“結論”，不能直接相當於爾的應用。
- 台灣的英語環境，與這些研究的語言背景，差得太多。在相似背景的研究中，有的反而顯示12歲再學比五、六歲好。

- 這些內容對你的影響？