FIRST LANGUAGE ACQUISITION

Refs Harley 2014 ch 3 and 4, Carroll ch 10 & 11, Fletcher p332-359. Yip & Matthews ch3.

NB Disclaimer

This is a course in linguistics and the development of children. If you are in any way concerned that a child known to you is not developing 'normally' then you need to consult an appropriate clinically qualified person such as a paediatrician or a speech therapist (French: *orthophonist*)**.** In particular, language development can be held back if there is deafness. Even a small reduction in hearing can be a problem. Fortunately, hearing tests are easy to administer and prompt diagnosis with early help can make a big difference.

A. METHODOLOGY [Teach: outline point 1 first, then explain in detail. This should take two hours to do, plus the theories in the next lesson. In addition, students have not yet covered the methodology, so you need to explain it carefully].

1. **Cross sectional**: the performance of a group of children at a particular age. Cp Synchronic linguistics.
   a. Concentrate on a few features, and try to establish norms, especially useful for educationalists and speech pathologists. Note, there are none for bilingual children.

   b. Perhaps do many cross-sections and compare, for instance, comparing first and third year students. This leads to "longitudinal corpus data".

   c. The problem of enormous linguistic variation between children of the same age:
      1) some children more advanced. Late starters. [explain, children begin to talk, 9months to two years, and parents/friends find it hard if a child is a little late. If in doubt, see a doctor, but it is normal that some children are 'late starters'. They catch up.
      2) differences in linguistic styles/personalities. Some children are 'chatterboxes'.

2. **Longitudinal** studies of individual children over time. **Diary/case studies.**
   a. Most of the detailed literature concerns just a few children.

   b. Probably, variation between individuals in development has been underestimated, therefore diary studies, in showing several ***different*** children can highlight and study differences, instead of seeking to establish what is normal. In studying one child, you can never be sure how 'typical' the child is.

   c. Can provide unique insights that experimenters can never capture. They can provide detail, over long periods of time, that is simply not available by using group studies. This can give a lot of depth, *insight*, into language as a whole, not just one or two features. This results though in a huge amount of data, which can be difficult to analyse. Whenever there is a large amount of data, the danger of bias due to the researcher selecting the data which is interesting, goes up. It is all too easy to report and exaggerate the good, and to ignore or downplay the bad.

   d. Can provide the context. The individual child is known well. Cross sectional studies, an hour a week, with many children, cannot put observations in context. Eg the well known phenomenon when children begin to talk of how they label things, and the labelling is very idiosyncratic. A child might refer to a woman as a 'goose'. Why? Because at a friend's

house, a man called his wife a 'silly goose'. So all women are a goose. Try explaining that in cross sectional studies. It would be 'odd', unexplainable, and as such may just be ignored as inconvenient data.

e. A case study may be used to refute a generalisation, "since even a single counterexample suffices for this purpose" (Yip & Matthews 2007: 57)

f. May provide a source of hypotheses which can be tested and refined in cross sectional or experimental studies. Yip & Matthews 2007: 57 report that "in practice, most recent contributions to bilingual first language acquisition have come from detailed case studies of a few children" and gives examples.

3. Problems with longitudinal studies

a. Very easily there is a lack of structure, so making comparisons and generalisations difficult. [WHY? Why is this important?]

b. The parent as a researcher introduces the problem of observer bias. Parent is emotionally involved with the child. Problems of exaggeration, missing out results etc. Parents will tend to report and exaggerate the good, and ignore or downplay the bad.

c. Unless recordings are made, it is impossible to check the transcription reliability. Plus, difficulty of recording. 24h/day? Everything? Transcribing is not easy. Around 10 hours work per hour of recording. But unless you record, how accurate are your notes? A lot of interaction happens when doing things with a child, like feeding, washing their face, changing a nappie, or calming them for bed. Are you really as a parent going to stop to take notes? Of course it is easier if two parents are researchers - one can deal with the child while the other takes notes, but the note taking is still disruptive and intrudes on the normal natural relationship and language. How can a parent and as a researcher fully and naturally wash the face of a child, while still noting down the language? If there are two parents, and one talks and interacts, while the other does the research, then this too is unnatural.

d. Most current individual development studies rely on video recordings at weekly or more frequent intervals. These studies usually focus on one or two features. Most studies use selective recording, eg 30-60 minutes per day. This is probably the only realistic solution.

e. The major limitation is the question of validity. Generalisation to a wider population is difficult.

4. **Small group experimental**

a. Data can be collected in a semi-structured way, to answer a single question. eg do children prefer certain words because of their phonology.

b. The problem with bilingual data is that you need at least three groups for comparison purposes, Monolingual language A, Monolingual language B, and bilinguals A and B.

5. Spontaneous speech

a. Data is usually ("typically") collected by recording interactions between child and adult in natural settings. In this way, the artificiality of experiments is removed.

b. But, the child may not produce everything that has been acquired.

c. There is also the problem from data from spontaneous speech that the data can be used as evidence for more than one hypothesis.

5. Compared with bilingual children

Whatever methods are used, studies in bilingual development call for systematic comparison with monolingual data.

6. The Child Language Data Exchange System (CHILDES)

a. Explain: corpus, corpus linguistics.

b. See http://tiny.cc/corpora for loads of links, many out of date.

c.

Three corpuses interesting to us.

Corpora for research on 1st language acquisition	
Child Language Data Exchange System (CHILDES) XML database **here**	c.20 m wds (180m characters), 20 languages. The CHILDES system provides tools for studying conversational interactions. These tools include a database of transcripts, programs for computer analysis of transcripts, methods for linguistic coding,& systems for linking transcripts to digitized audio & video. Includes a language acquisition **bibliography**
Lancaster Corpus of Children's Project Writing (LCPW)	a digitized collection of project work produced by children aged between 8 & 11; part of a larger research program (a longitudinal study of children's writing-for-learning, based on the writing of 8-12 year old children)
Polytechnic of Wales (POW) Corpus	100,000 wds spoken English by 120 children, aged 6-12; parsed according to Hallidayan Systemic-Functional Grammar. See the manual **here**. Distributed from two places: **The Oxford Text Archive** orgainsed by Lou Burnard. & **ICAME** in Bergen, Norway (icame@hd.uib.no) organised by Knut Hofland. The **AMALGAM** tagger emulates the POW tagset

d. Childes

This is a corpus established in 1984 by Brian MacWhinney and Catherine Snow to serve as a central repository for first language acquisition data. Its earliest transcripts date from the 1960s, and it now has contents (transcripts, audio, and video) in 26 languages from 130 different corpora, all of which are publicly available worldwide. Recently, CHILDES has been made into a component of the larger corpus TalkBank, which also includes language data from aphasics, second language acquisition, conversation analysis, and classroom language learning. CHILDES is mainly used for analyzing the language of young children and the child directed speech of adults

During the early 1990s, as computational resources capable of easily manipulating the data volumes found in CHILDES became commonly available, there was a significant increase in the number of studies of child language acquisition that made use of it. CHILDES is currently directed and maintained by Brian MacWhinney at Carnegie Mellon University.

There are a variety of languages and ages represented in the CHILDES transcripts. The majority of the transcripts are from spontaneous interactions and conversations. The transcriptions are coded in the CHAT (Codes for the Human Analysis of Transcripts) transcription format, which provides a standardized format for producing conversational transcripts. This system can be

used to transcribe conversations with any type of language learner: children, second-language learners, and recovering aphasics. In addition to discourse level transcription, the CHAT system also has options for phonological and morphological analysis. The CLAN program was developed by Leonid Spektor and aids in transcription and analysis of the child language data.

To date, over 4500 published studies cite CHILDES. CHILDES reports this number in their manuals and Google Scholar contains 4833 citations as of July 2015. (Wikipedia Oct 2015).

7. HAS and HT

See Clark ch3 p54-5 What Infants know about language for an explanation of two methods:

- High amplitude sucking
- Conditioned head turning.

Also see Zsiga 2013 chapter 20. You may find this reference filed under phonetics. They write:

In order to study infant speech perception (as opposed to production), the investigator needs to be more ingenious. You cannot just ask babies, "Did that sound the same or different to you?" Two experimental approaches to studying infant speech perception are the high-amplitude sucking (HAS) paradigm, and the head-turn preference (HT) paradigm.

These paradigms can be implemented in different ways, but essentially, both measure a baby's response to a stimulus perceived as different. A newborn infant will increase her rate of sucking on a pacifier when she hears a new sound, and a six-month-old will turn her head toward a sound she perceives as different and therefore interesting. By playing different sequences of sounds and carefully noting how the babies respond, an investigator can discover what differences babies can perceive, and what they can't.

A problem with both the HAS and HT paradigms is that a large percentage of babies fuss, cry, look around randomly, or fall asleep in the middle of the experiment. An investigator has to plan on testing many more children than she'll need, knowing that a lot of the data will be unusable because the child could not finish the study. (Parents, who are usually excited to have their little scientist participate, are never told that their baby failed. The babies get sent home with a cute t-shirt no matter what.)

8. A third methodology gets around the attention and behavior problem by using direct measures of electrophysiological brain activity. In the brain of either an adult or child, neurons in specific areas of the brain activate in response to a stimulus, producing a specific pattern of electrical activity known as event-related potentials (ERP). ERP responses are measured from a set of electrodes set in a cap placed on the baby's head. Different stimuli are played, and responses to the stimuli are compared: if the baby's brain detects the change, there is a corresponding change in the ERP output. The brain is an electrically noisy place, so many trials must be recorded in order for a statistically significant pattern to emerge. Happily, however, the ERP response works whether the listener is paying attention or not. The experiment can proceed while the baby is distracted with a quiet toy or silent video, with the sound stimuli playing in the background.

Any of these types of studies can be either longitudinal or cross-sectional.

Mampe 2009.

Abstract
The observed melody contours of French and German newborns' crying show that they not only have memorized the main intonation patterns of their respective surrounding language but are also able to reproduce these patterns in their own production. Newborns produced significantly more often those melody types and intensity contours that were prosodically typical for their native languages: French newborns preferentially produced rising (low to high) contours, whereas German newborns preferentially produced falling (high to low) contours (for both melody and intensity contours).

Extracts
Human fetuses are able to memorize auditory stimuli from the external world by the last trimester of pregnancy, with a particular sensitivity to melody contour in both music and language [1–3]. Newborns prefer their mother's voice over other voices [4–8] and perceive the emotional content of messages conveyed via intonation contours in maternal speech (''motherese'') [9]. Their perceptual preference for the surrounding language [10–12] and their ability to distinguish between prosodically different languages [13–15] and pitch changes [16] are based on prosodic information, primarily melody. Adult-like processing of pitch intervals allows newborns to appreciate musical melodies and emotional and linguistic prosody [17]. Although prenatal exposure to native-language prosody influences newborns' perception, the surrounding language affects sound produc-tion apparently much later [18]. Here, we analyzed the crying patterns of 30 French and 30 German newborns with respect to their melody and intensity contours. The French group preferentially produced cries with a rising melody contour, whereas the German group preferentially produced falling contours. The data show an influence of the surrounding speech prosody on newborns' cry melody, possibly via vocal learning based on biological predispositions.

Prosodic features such as melody, intensity, and rhythm are essential for an infant acquiring language [22]. There is compelling evidence that infants are sensitive to prosodic features of their native language long before speech-like babbling sounds are uttered or ?rst words are produced [22, 23]. Indeed, auditory learning starts as early as the third trimester of gestation [24, 25], and prosodic features are well preserved across the abdominal barrier, whereas phonetic aspects of speech are disrupted, making prosodic characteristics very salient for the human fetus [26]. In newborns, traces of early auditory learning processes are reflected in perceptual preferences for melodies to which they were exposed prenatally [1, 10, 14, 27, 28].

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Notes from Handbook of Psychology 2003. Vol 6, ch3. Infant perception and cognition

1. Berlyne (1958) measured the visual fixations of 3- to 9-month-old infants. On each trial, two black and white checkerboard patterns that differed in brightness or complexity were placed on a display board in front of each infant. An observer who could not see the patterns called out the direction of gaze of the infant—a technique that allowed Berlyne to determine to which pattern the infant first fixated. One of Berlyne's findings was that infants first looked at a complex pattern, such as a checkerboard with many squares, more than at a simple pattern, such as a checkerboard with few squares.

2. Among Fantz's findings were that infants tend to prefer patterned surfaces to uniform surfaces and complex patterns to simple patterns.

3. This preference for novelty has become the underlying basis of the most widely used research tool for investigating infant perception and cognition—the infant visual habituation paradigm. Although many variations of this paradigm exist, a prototypical example would be to repeatedly present one visual stimulus until an infant's looking time habituates to some criterion level, such as 50% of the infant's initial looking time. Novel and familiar test stimuli would then be presented to see if the infant looks longer at (i.e., recovers to) the novel ones. Doing so indicates that the infant can differentiate between the novel and the familiar stimuli, even though initially the infant may not have had a natural preference for one over the other.

4. The infant visual habituation paradigm has been used for over three decades to investigate basic and esoteric questions related to infant perception, attention, memory, language acquisition, object knowledge, categorization, and concept formation. Differences in habituation and recovery have been reported between normal and aberrant infants, and both habituation rates and preferences for novelty appear to be moderately correlated with later IQ.

5. Several studies have shown that a preference for familiarity often precedes a preference for novelty. Furthermore, this early preference for familiarity seems to be stronger in younger infants. It is also stronger when the information-processing task is more complex or difficult for the infant.

6. Hunter and Ames (1988) have summarized these conditions. According to them, the time it takes for an infant to be familiarized to a stimulus—that is, show a novelty preference—depends upon both the age of the infant and the complexity of the stimulus. For example, the familiarity preferences for older infants (e.g., those over 6 months of age) should be very brief compared to those for younger infants(e.g., those under 6 months of age), and within an age group the familiarity preferences should vary according to stimulus complexity.

7. The bottom line is that if younger infants are repeatedly shown very simple stimuli—or if older infants are shown moderately complex stimuli—both groups are likely to produce the classic monotonically decreasing habituation curve. On the other hand, if infants at either age are shown dynamic moving scenes involving multiple objects, they are likely to prefer familiar scenes prior to preferring novel ones.

8. Therefore, it becomes important in such studies to habituate all infants to a relatively stringent criterion and to include both familiar and novel stimuli at the end to test that the infant indeed prefers novelty. Unfortunately, many infant habituation studies today do not adhere to these procedures.

9. A variety of conditioning studies have also been used to investigate infants' perception of speech (e.g., Eimas, Siqueland, Jusczyk, & Vigorito, 1971), all of which relate either to visual preferences, visual habituation, or both. Such studies have frequently used a high-amplitude sucking procedure in which infants first are conditioned to suck in order to hear a sequence of speech sounds. That procedure continues until their sucking habituates, at which time the speech sounds are changed and recovery of sucking is assessed.

10. Many more recent studies of infant speech perception and early language ability have turned to visual attention as the measure (e.g., Jusczyk & Aslin, 1995). For example, infants may learn to look at a specific location to hear a particular sound. Then a new sound is introduced and changes in looking time are assessed. We find it interesting that just as in the visual perception literature, some disagreement exists as to whether the infants should look longer or shorter when a novel stimulus is presented. We cannot list all possible techniques that can be used to assess infant perception and cognition, but as we have described, many are related either procedurally or logically to two very important techniques— infant visual preferences and visual habituation.

B. PHONOLOGY

1. Prelinguistic Communication

a. **Refs**: Carroll Ch 10 p248-256. Clark ch 3. Zsiga 2013 ch 20.

b. Check students know the difference between: Perception (listening) vs Production (speaking). Perception Precedes Production.

c. Babies can hear even in the womb. The structures of the ear have developed by six months' gestation, and sound travels through the amniotic fluid. The prosodic characteristics of speech – pitch, stress, and timing – are especially clear. Because of this pre-natal exposure, babies recognize their own mother's voice at birth, and can distinguish their native language from other languages. One study has found that newborns can even recognize specific stories that their mother has read aloud during pregnancy. In each of these cases, babies are recognizing and responding to familiar prosodic patterns.

d. Numerous perception studies have established that babies are born with the ability to distinguish any and all speech sounds. American newborns and Thai newborns are equally good at distinguishing [ba] vs. [pa]; American newborns and Japanese newborns are equally good at distinguishing [da] vs. [la]. This is an important first stage of language acquisition: a baby is born ready to acquire any language that will be spoken around him. There is no genetic predisposition to any par- ticular language: babies adopted interculturally, for example, have no problems acquiring the language of their adoptive families.

e. Between the ages of six and twelve months, however, a change occurs. Babies begin to specialize in the particular sounds that are contrastive in their ambient language, and become less sensitive to other contrasts. Results of one study showing this effect are shown in Figure 20.1, which graphs the ability of Japanese and American babies to distinguish syllables containing (r) and (l)

At six months of age, the two groups of infants respond identically: 65% of the time, a six-month-old baby, either American or Japanese, will notice when a stimulus changes from (r) to (l) , and respond by turning her head. (65% is not extremely high, but as noted above, babies are not particularly well-behaved experimental subjects.) At ten months of age, however, the groups diverge. **The American infants have become better** at hearing the distinction, but the **Japanese infants have become worse**.

p468. Similar studies on non-English contrasts show similar results: at 6 months of age, Taiwanese (Mandarin-learning) and American (English-learning) infants are equally able to distinguish two syllables which are contrastive in Mandarin, but do not occur in English. At 12 months of age, the Taiwanese babies have become better at hearing the distinction, and the American babies have become worse. Studies such as these show that babies at around one year old are learning to pay attention to sound differences that are important in their native language, and learning to ignore sound differences that are not.

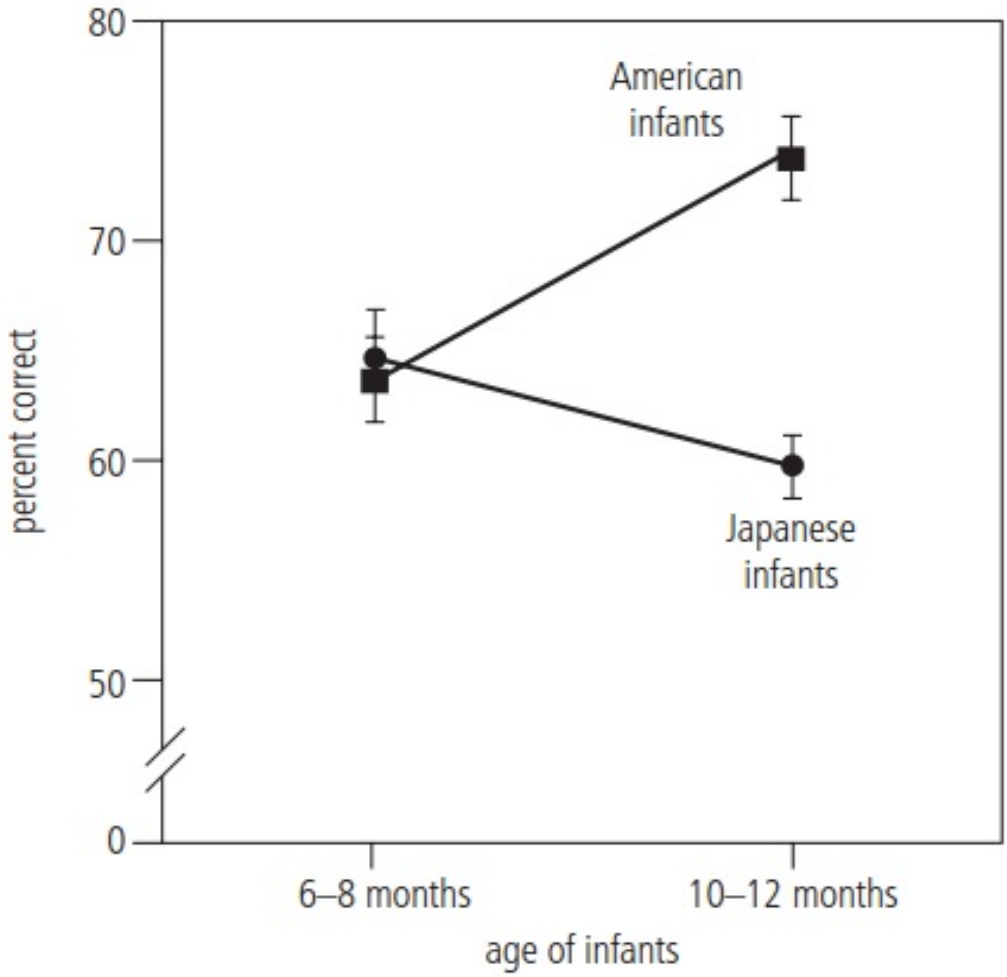


Figure 20.1 Discrimination of [ɹ] and [l] by American and Japanese infants.

Source: Kuhl, P.K., Stevens, E., Hayashi, A., Deguchi, T., Kiritani, S. and Iverson, P. 2006. Infants show a facilitation effect for native language phonetic perception between 6 and 12 months. *Developmental Science* 9 (2) March 2006, F13–F21. Reprinted with permission of John Wiley & Sons Ltd.

2. Extracting forms– Clark p51ff

A baby is faced with the following types of problem as they begin to communicate

a. **Segmentation problem** – how to go about identifying units in the speech stream such as phonemes, morphemes, words and phrases. By 8months a child can pick out words from non-words.

b. **Invariance problem** – spoken language is NOT invariant. Phonemes are heavily dependent on context – huge amount of allophony. Isolated forms are different to forms in connected speech. Individuals are not consistent in pronunciation.

c. **Language problem** – a child has to work out which sounds belong to a language.

They do this by focussing on communication. Children need to differentiate phonemes, and also detect language chunks. so that they can recognise them, from one occasion to the other (segmentation problem), from one context to the next, and from one speaker to the next. They learn in a social context where meaning takes priority.

3. Major concepts

a. **Communication**, and the social uses of words, begins long before words are understood. Newborns prefer the voice of their mother. cp hearing under water. Foetus can hear well at 6 months. Amniotic fluid.

b. **Gestures** precede words eg smile, cry. Around 8 months they begin to use gestures, such as pointing and showing, in a communicative manner. ie communicative intent.

c. **Prelinguistic** children use gestures to get attention and to communicate. The transition to speech acts can then be viewed as learning how to do with words what already has been done without words.

----------Gestures----------	
	----------Words----------

Question: When do children begin to know the difference between right and wrong? How do we know? When children start to manipulate parents! To disobey them!

Children age 6 months onwards know the difference between right and wrong. They know what 'no' means. They can understand *consequence*. No, ->distract, move, tap on hand, spank. Example of 'hot'. For many children in the early stages, Hot is almost synonomous with No.

NB children need interaction not just TV. Children need books, age 12 months! Importance of stories.

4. Motherese

a. Adult talk to children does not happen in all languages and cultures, but children learn anyway.

b. Motherese is characterised by high pitch with exaggerated contours, slow tempo, repetition, and hyper-articulation of segmental contrasts. "Look at the doggy! See the doggy? What a nice doggy!" Babies prefer listening to speech that has the characteristics of motherese, and it is likely that slowing down, repeating, and exaggerating contrast helps babies notice important information.

4. TV

Motherese may not be necessary to language acquisition, but human interaction is. You can't acquire language from watching TV. To test this hypothesis, Patricia Kuhl and colleagues studied three groups of English-learning nine-month-olds. one group interacted with a Mandarin-speaking adult for twelve 25-minute sessions over several weeks. The second group watched the same adult on TV doing and saying the same things for the same amount of time, the third group just heard the audio. At the end of these sessions the infants were tested on a Mandarin contrast. Those English babies who had interacted with a real Mandarin-speaking person performed just as well in the test as Taiwanese babies who had heard nothing but Mandarin their whole lives. Those few hours of live exposure were sufficient for them to remain sensitive to the Mandarin contrast. The babies who got only TV or audio input, however, were no better at distinguishing the two contrasted sounds than babies who had never heard Mandarin at all.

5. The development of speech perception (Carroll p256, Fletcher p48 Clark ch 3)

a. Infants are born with the ability to perceive (sense, detect, identify) phonemic distinctions, and they are NOT limited to those of the society language. If you can identify a sound you can perceive it. The ability to perceive distinct phonemes is an example of "categorical perception". The ability to divide a continuum such as a vowel continuum into two or more distinct parts seems to be innate. This perception (for sounds) declines in strength during the first year of life.

In other words, the ability to perceive phonemes appears to be innate. Initially these phonemes are not just the ones they hear. This perception declines in strength during the first year of life.

Infants, like adults, can detect repeating sequences in the sound stream ie they can recognise two sequences as similar. Infants 8m can do this on a new language after only 2 minutes exposure – they could reliably distinguish words from part words.

The ability to identify high frequency clusters is the beginning of segmentation, and there are signs it starts from a few weeks old.

Implications for multilingualism. Expose your child to three languages. eg talk in English for a few hours a week. One parent always talks in English, the other always talks in French. Must keep alive sensitivity to phonemes that are not used in the dominant language.

b. Infants develop the ability to distinguish between probable and less probable sound sequences, not just phonemes. This means they begin to detect clusters and syllables. This ability is foundational to segmenting speech into words. (Fletcher) But it is only from 9 months onwards that they understand words in context. 10-13 months they begin to genuinely distinguish between sounds, as shown by their ability to learn new words for objects.

phonemes ⇛ syllables ⇛ words

Compare the enormous difficulty of defining a syllable. Voice recognition software initially required people to pause between words. So how does a baby do it?

c. Once a child has developed a preference for the local language they start showing a preference for the intonation of that language.

d. By 9m a child appears to know the permitted clusters for syllables.

6. Byers-Heinleim 2010

"Research has demonstrated the importance of rhythmicity in early language processing. Newborn infants exposed to only a single language prenatally show greater interest in their native language than in an unfamiliar language from a different rhythmic class (Mehler et al., 1988; Moon, Cooper, & Fifer, 1993). Preferential attention to the native language shows an early effect of learning on language processing, either during prenatal development or immediately after birth. Studies also show that monolingual neonates can discriminate two languages from different rhythmic classes even if both are unfamiliar but typically fail at discriminating languages within the same class." p343

". . . our results demonstrate that from birth, the recognition and discrimination skills that support monolingual acquisition also support bilingual acquisition." p344

"The current work reveals that language discrimination in bilinguals is robust at birth and that language preference at birth reflects previous listening experience. Monolingual newborns' preference for their single native language directs listening attention to that language. Bilingual newborns' interest in both languages helps ensure attention to, and hence further learning about, each of their languages." p347.

"This study investigated neonates who were learning rhythmically distinct languages. Still unanswered is whether the same sensitivity to rhythm can also support infants' acquiring two languages from the same rhythmic class." p347

"In sum, these findings show that from the very beginning, the same perceptual and learning mechanisms that support monolingual acquisition are also available to support bilingual acquisition. Moreover, our results confirm that infants exposed to two languages throughout gestation have already begun the process of bilingual acquisition at birth." p347.

7. Cunningham 2011

"Pearson (2008: 245–54) goes through a large number of studies which looked at the commonly used milestone measures of child language development, such as the production of the child's first syllables, first words and first two-word combinations, and found in every case that the difference between monolingual and bilingual groups of children was within the range of variation thought of as normal in monolingual children. This range is very wide, and it seems that individual factors are more important than whether the child is learning one or more than one language." p170.

Research into the ability of very young children to recognise the sounds of their own language carried out by the team led by Janet Werker (see, for example, Byers-Heinlein et al. 2010) at the University of British Columbia in Canada has shown that very young children not only can recognise their own language or languages when they hear them, but can also distinguish between more than one language that they hear in their surroundings. Whereas babies who are exposed to just one language stop hearing differences between sounds that are not important for their language, babies with more than one language hear differences that are important for both their languages. In situations where there is an overlap between the sound systems of two languages a young child hears, she will hold off on settling for a language-specific way of hearing the sounds until later than monolingual children who hear either of the languages. In one sense this can be viewed as a delay, but actually it is a useful strategy for those learning more than one language to maintain flexibility in this way. p170-171

[This means that most BL infants are no later than some monolingual children, which are often mistakenly called 'normal'].

This team of researchers has also looked at the way older infants (14–17 months) learn words. They found that children who have more than one language around them keep their options open longer than monolingual children when deciding whether two similar sounds are the same or different. Bilingual children were a few months older before they were able to distinguish between similar words. Again, in one sense this is a delay, but in another it is an adaptation to the bilingual setting. p171.

IL. One problem seems to be parental expectation. Another may be that parents do not recognise the speech as real language if the parents are listening in the wrong language.

8. Yip & Matthews 2007. Ch 2. Theoretical framework

1. Experimental evidence shows that 4–5-month-old bilingual infants have the perceptual abilities to distinguish two rhythmically close languages (Spanish and Catalan), for which discrimination is considered especially challenging (Bosch & Sebastian-Galles 2001). Bilingual infants, like monolinguals show clear and early auditory discrimination between languages without any delay. Such evidence for early perceptual differentiation during infancy makes it 'strange to imagine that languages would be undifferentiated at age 3' (MacWhinney 2001: 257). What remains to be fully specified are the underlying perceptual mechanisms that make differentiation possible.

2. In terms of production, there is evidence that bilingual infants develop differentiated systems during the babbling stage before they begin to produce their first words (Poulin-Dubois & Goodz 2001). Thirteen French-English infants with average age at 12.6 months were found to babble in a dominant language, i.e. French-type babbling is seen in the majority of bilinguals with French mothers. The dominance of French in the babbling was attributed to the prosodic salience of maternal speech and the 'bilingual-to-be infants' going for a syllable-timed structure with more regular suprasegmental properties as a model for early babbling.

3. Another major type of evidence for differentiation comes from word order and morphosyntax observed in the speech of a wide variety of bilingual children acquiring different language pairs which reflect structural properties and constraints on grammatical operations specific to each of the two languages, e.g. language-specific headedness of syntactic categories (VP and IP), finiteness and its syntactic consequences such as verb raising are acquired early in French-German bilingual children (Meisel 2001).

(Points 1-3 quoted from p34.)

p36. The authors make the point that one language is usually dominant. Also, this dominance is not static, the patterns may change with time and individual experience. The authors fail to mention the CEFR and the major concept of plurilingualism, where language dominance may depend on the domain and function.

9. Intonation

a. Infants can distinguish between languages by 4 days. (Carroll ch 10 p258, reference cited but no explanation. Presumably this is on the basis of intonation, which develops more rapidly than words! Also Clark p58.

b. Generally accepted that children are able to produce recognisable sentential [sentence like] intonation patterns before they are even producing protowords. ie children use intonation before they are using words. [I usually find students need a demonstration of this].

c. In English, the first tune to be acquired is the simple falling pattern.
Gradually, level tones, rising tones, and tones that both fall and rise are added.

d. Children do not completely master the stress patterns of their language until they are about 12 years old.

10. Babbling

Children's early vocalisations are called 'coos', which are more varied than cries. They tend to be made in the back of the mouth and are similar to back vowels and velar consonants. Babbling proper begins around 6-7 months.

a. **Types**
   1) **reduplicated.** CVCVCVCV
   2) **non-reduplicated/variegated** eg bamido, by 11/12 months.

b. **Duration:** for 6 months continuing well into Y2

c. **Universal?** Apparently, though deaf children produce slightly different patterns, suggesting what? (that speech perception plays some role). Across 12 countries, similar, but not totally. Deaf children are similar to, but not completely like hearing children, suggesting that very quickly there is a role for hearing and a role for the local language.

d. Clark ch 5:

1) When children start to talk, it is difficult to identify their first words.
2) Young children are inconsistent in how they produce the same word on different occasions
3) Some children continue babbling well into Y2.

Therefore, it is hard to decide, is it babbling, or is it an attempt to produce a new word?

e. More elaborate syllable types

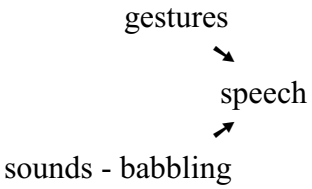
1) CV, then CVC with the same place of articulation for both consonants. Then the consonant places can vary. Also, more vowel contrasts develop. (Clark p109).
2) In English there is an attention to the stressed syllable, and a corresponding neglect of grammatical morphemes such as articles pronouns and prepositions.
3) Weak syllables before a strong syllable are likely to be omitted.
   eg the LAMB kissed the bear –> LAMB kissed the bear

NB great individual variation. Children do NOT follow the same path from babbling to words.

NB. Children appear to articulate most clearly the NEW information in a conversation, instead of the given information. (Clark p118).

11. Transition to early speech

a. By end Y1, the use of gestures to convey meaning, and the mastery of sound in non communicative situations, begin to merge such that the child is able to use speech sounds to communicate meaning. In other words, communication begins with gestures. Words first have to be learned for gestures, then words become increasingly important. Nature is important in the beginning, then becomes less important as learning accelerates. **Nature gives way to nurture.**



b. As children grow there is:
   1) greater motor control of the speech apparatus, so sounds can be made more precisely.
   2) cognitive maturation, which enables infants to express communicative intent.
   3) the dawning awareness that specific objects are represented by specific symbols in the local language, ie things have names.

c. **Idiomorphs** ie personalised words, idiosyncratic. They show that child language is creative, it is not just imitation..

12. Later phonological development

a. The common view is that children produce all the sounds, even non-phonemically ie the whole continuum, and the non-phonemes are gradually eliminated. This is especially true for vowels, which exist as a two dimensional continuum, like the side of a hill.

b. The reality is that as children grow:

1) Early speech used a restricted set of sounds compared with babbling AND this early speech includes sounds that were rarely produced or not produced at all in babbling
2) The learning of phonemes continues well into the word formation stage. Words will often be changed after they have been mastered. After babbling a child will usually go on to learn more phonemes.
   eg th sound, in primary schools, has to be taught and insisted on for some children. Eg have you ever heard a baby say the 3yn sound? Not all sounds, especially not all consonants, are produced in babbling.
3) Children appear to be hypothesis testing, with each new hypothesis requiring a change in pronunciation of some words already mastered.
4) Simplification of output (12-24 months) It is well know that infants simplify the words they produce. They often:
   a) produce shorter lengths of speech,
   b) omit the final consonant,
   c) reduce consonant clusters,
   d) miss out unstressed syllables,
   e) repeat syllables,
   f) substitute easier sounds for more difficult sounds (those not found in the babbling repertoire). But: children can usually perceive the sounds they cannot yet produce. eg, “One, two, fwee” said by a four year old, son of an Arab-American.

13. Single word utterances

a. Age one, begun. By age 2, about 50 words. 12-18 months it is mainly single words, in line with their conceptual development eg the ability to label, and make comments about the world around them.
b. Comprehension (perception) precedes production
c. Children differ greatly in their earliest words. Idiosyncratic
d. Often one word has to make do for several that an adult might use. Overextension. eg "boy" for all males.
e. Children will often actively avoid, and refuse to say words with sounds or sound sequences that they cannot say. Children are often well aware that their attempts are wrong. Other times they are not aware of the inaccuracy of their speech. (Fletcher 346).

14. Simplifications in production

There is considerable consistency in the problems children encounter in production (Clark p105-6).

a. Substitutions

1) Often voice the voiceless initial C eg by instead of pie
2) Often devoice final C eg sop instead of sob
3) Some children compensate by adding a nasal consonant (n or m) after the plosive eg dadn instead of dad. This is because nasal consonants in final position are easy and they maintain the needed voicing.
4) Use a plosive instead of a fricative eg [tæwiʃ] for sandwich and [bʌd] for [bʌs]

b. Assimilations

Mainly reduplications

c. Omissions

1) Children often omit the final C or the final unstressed syllable. By age three this is less than 10%.
2) Consonant cluster simplification eg stop ->top. Priority is given to the plosive.
3) When a fricative is combined with a semivowel/r (Clark calls this a glide) children often produce only the fricative eg fom instead of from, [fu:] instead of few.

d. Word initial sounds are easier, but word final clusters are easier.

15. Language spurts

Cunningham 2011 p173

Children do not learn new words at an even rate, though, rather in fits and starts. This is particularly clear in the case of children learning more than one language. Pearson (2008: 254–56) describes a study at the University of Miami where it was found that bilingual children aged from 10 to 30 months experienced lexical spurts, periods of particularly fast vocabulary development, in one language at a time. Another study at the University of Miami (Pearson 2008: 259) showed that bilingual children from 10 to 16 months had slightly smaller receptive vocabularies in either Spanish or English than monolingual English-speaking children, but their total conceptual vocabulary, 'the number of labels they recognise for things in the world', was significantly larger than for the monolingual children.

So it seems that, while there are differences in the timing of various linguistic milestones for bilingual children, it is not really possible to speak of a typical delay in language acquisition. Two languages are not learned in exactly the same way as one, and the child is able to transfer some of what they learn in one language to the other.

16. Babbling and early speech There are two contrasting and opposite hypotheses:
[Note, this can be confusing at first. Therefore study it for yourself, and be prepared to summarise the different hypotheses]

a. Continuity hypothesis

This is the common, naive, simplistic, uninformed, popular, limited and ignorant view.

1) Description

In babbling the child produces many of the sounds that are to be found in all of the world's languages. This is then gradually narrowed down, through (positive) reinforcement by parents and others, and (negative) lack of exposure to sounds in other languages, ie to the set of phonemes in the particular language (Harley 353 modified).

2) Evidence

Babbling is universal, and it is modified by the language a child is exposed to.

3) Against

a) Many sounds, such as consonants and consonant clusters, are not produced at all in babbling

b) Parents are not selective in their reinforcement -- all vocalisations are reinforced, not just the phonemic material. Adult language with children is often not very 'adultlike' at all!

b. Discontinuity hypothesis [ie babbling then words]

1) Description

Babbling bears no simple relationship to later speech development. Jakobson 1968 postulated two stages:

a) first stage: random production of some sounds, no particular order

b) second stage: sudden disappearance of many sounds, some disappearing temporarily, others being dropped completely. Jakobson argued that it is only at this stage that children are learning phonemes, and these phonemes are acquired in an invariant order.

c. **Discussion** (Fletcher 332ff)

1) Individual differences are considerable, therefore it is hard to generalise.

2) There is evidence from children of 4 months that they respond differently to speech/non-speech sounds, and that they can imitate some phonemes. Speech is a multimodal event, integrating hearing with speaking. This means that speech is intimately interlinked with hearing. There is evidence that even in the first year infants adjust their speech according to the linguistic environment.

3) Some late babbling resembles adult speech, and lead to early words around 11-12 months. There is a continuity between babbling and adult speech.

4) For most infants, the phonetic characteristics of babbling persist into early word production and may have a selective influence on early words. Early words have many similarities with the features of babbling, eg trying out different syllable combinations. Also, sounds classified as 'babble' may have sound-meaning correspondences eg Ba-ba referring to father. **Babbling does have an element of context dependency**. This is evidence for the continuity hypothesis. eg pee-pee, wee-wee, ka-ka. (Duplication). Both start spontaneously and quickly become contextualised.

5) Many of Jakobson's views (in favour of the discontinuity hypothesis) about phonological acquisition have been supported, but his views on the relationship between babbling and early speech have not. There is a link, but it is not a simple one.

6) The role of motor practice (in this case, speech), and hearing one's own vocalisations (ie hearing oneself) is important (Fletcher 340).

17. What can we conclude?

a. There is some element of truth in the continuity hypothesis, but life is not as simple as the hypothesis suggests.
b. In English. Note how the class of phonemes known as plosives (stops), precedes fricatives and affricates. This is well established.
c. Babbling produces most sounds but not all.
d. There is some narrowing down, some selecting
e. There are huge individual differences
f. Hearing is important
g. The research is limited in that it has only considered phonemes.
h. Parents do NOT appear to be selective, ie to encourage only the local phonemes, therefore a narrowing must be linked to the growing attention to the local language.
i. Infants prefer new words that resemble their babbles

18. Clark p94ff

Young children are also inconsistent in how they produce the same word on different occasions. Their pronunciations vary more than adults' do from one occasion to the next, and, in their first few months of talking, they may produce multiple versions of the same word (Ingram 1974; Maekawa & Storkel 2006; Sosa & Stoel-Gammon 2006). One child, Philip, used as many as five different versions of blanket within a month. At age 1;9, he had multiple versions of 50 of the 125 words in his repertoire. Another child, Fernande (learning French), at one stage used five different pronunciations for chaise 'chair'. And at age 1;5, she too had multiple versions for nearly half her words, 47 out of 114.

Since children continue to babble until several months into their second year, it is hard to tell at times whether they are producing a short babble or attempting a word. Together, these factors – simplified forms, varying pronunciations, and overlap with babble – all make it hard to draw a clear line between children's babbling and their first productions of words.

What relation is there between infants' babbling and their first recog- nizable words?
Is there continuity of vocalizing from six months up to and past the age when children first produce words? Or, is there a break between babbling and talking? Researchers have taken different positions on this.

Some have argued for continuity because both babbling and speech involve vocalization. They assume that babbling is a direct precursor to speech. At the same time, since infants produce a number of sounds in babbling that are not represented in the language around them (e.g., uvular r sounds produced in the back of the throat and fricatives like the final sound in loch in the babbling of infants exposed to English), these researchers have sometimes also assumed that parents must selectively encourage or reinforce their children to produce just the right sounds, so they will narrow them down eventually to just those in the target language (e.g., Mowrer 1960).

However, parents don't appear to be selective: They tend to encourage all infant vocalizations regardless, so any narrowing down must reflect the growing attention infants pay to the surrounding language (Chapter 3). The absence of a full match in infants' babble versus speech repertoires presents a further problem: Some sounds that appear in babbling may not emerge in their words until two or three years later.

These observations about babbling have led other researchers to assume discontinuity instead and to argue against any connection between babbling and early words. Jakobson (1968) argued strongly for this view on the following grounds: Infants typically make use of different repertoires of sounds in the two activities (babbling and first words); they sometimes stop babbling for a short period (typically while starting to walk) before they produce their first words; and the system of sounds infants use in their first words requires attention to phonological contrasts, unlike the sounds used in babbling.

More recent analyses offer support for continuity over discontinuity. First, babbling typically continues until well after the appearance of children's first words, and a number of analyses have shown that there are strong similarities between the phonetic sequences in babbles and early words (Oller et al. 1976).

Many infants use intonation contours carried by babble sequences to mark proto- requests and rejections, for instance, before the emergence of recognizable words. Work by Elbers and Ton (1985) also suggests that, although parents do not reinforce infants for using some sounds over others, young children themselves show considerable continuity from babbling to early words in their choices of the sound sequences attempted in their first words. In addition, they appear more likely in their first words to attempt sounds that had appeared previously in their babbling and to avoid sounds that hadn't. Finally, young children continue to produce babbled sequences alongside words until as late as age two or two- and-a-half (see also Robb, Bauer, & Tyler 1994). Babbling, then, seems to lay a foundation for producing words.

C. LEXICAL DEVELOPMENT (Carroll ch 10 p266ff)
Take the following sentence: [hat hats hat]. There are three tokens, two types, and one family.

1. Counting words

a. **Tokens**, ie running words, as in word count. Used for words in a book, typing speed, reading speed etc 'don't' counts as one word. Tip. If you want to see this for a Microsoft Word document, go to File, Properties, Statistics and then you can see the word count.

b. **Types** ie different words, each **word form** eg a singular and plural being counted separately.

c. **Lemmas** ie a headword and some of its inflected and reduced forms (n't). Usually, this term means that only the same parts of speech are included, but variant spellings are included. There is a problem with irregular forms such as nice, is, brought, beaten, best.

d. **Word families/groups**. These consist of a headword, its inflected forms, and its closely related derived forms eg adding -ly, -ness and un- NB prefixes as well as suffixes.

2. Early words

a. Children begin by focussing on words related to the here and now.

b. Many of the early words consist of concrete nominals, related to their environment.

c. Early vocabulary is not limited to nominals. Children use several grammatical classes early on.

d. (Fletcher 48ff). There is a general order of priority in English: nominals, verbs, modifiers (dirty, pretty) personal and social words (want, 'want it', please) and function words (what, for).

e. Estimates are, by Y6, up to 14,000 words (actual types, not word families) ie 8 per day learned. Presumably 5000 nouns plus 5000 plurals equals 10,000 words. sign, signed, signal, all counted as separate words. But, this does not mean that all 14,000 are fully known, in terms of meaning, connotation, denotation, spelling etc. Therefore, it is safer to say there are the beginnings of 14,000 words. NB adults can organise words into families and apply rules of word formation, unlike children.

denotation: the primary sense of a word
connotation: the wide array of positive and negative associations that most words naturally carry with them.
collocation: a sequence of words or terms which co-occur more often than would be expected by chance. These are very cultural. Eg, nurse + female. The easiest examples are the collocations of tea. In English we have a cup of black tea or white tea. In Tunisia, you ask for red tea or green tea. Collocation comprises the restrictions on how words can be used together, for example which prepositions are used with particular verbs, or which verbs and nouns are used together. Collocations are examples of lexical units. Collocations should not be confused with idioms.

3. Overextensions and underextensions

a. One part of lexical development is referential learning (learning the reference of a word). Children often make errors of assignment of new objects to word classes. When they include too many items, this is overextension. eg referring to all four legged animals as dogs, or to all round objects as moon.
Cp adult L2 language learning, where one learner strategy is to learn superordinates first. eg 'building' which covers apartment, house, and bungalow. Children cannot use this strategy. Why? Because of their conceptual development and their lack of practice in grouping and classifying.

b. Underextension is also possible. eg Where are the shoes? -> one pair only, bypassing other shoes en route when looking for the specific example the child knows about.
A child's vocabulary is not that of an adult.

4. The role of adult speech

Adult naming practices guide children through lexical development.

In adults when there is a new idea. Several options:

- new word or phrase comprised entirely of new words
- extend the meaning of an old word or phrase
- use a phrase built from existing words
- use a phrase built from existing words + new words

We know from Cassels and Johnsone 1984, 1985 that learning new words is easier than learning a new meaning to a word already known.
NB. Use cited by for more recent articles on the same subject. There are some MA theses here.

D. MORPHOLOGY (Carroll ch 11, Fletcher p349 only, Foster 76-8).

1. Introduction

a. Before children have finished mastering phonemics, they have begun the morphology (rules of word formation) and morphophonemics (the contextual variations in shapes of morphemes which are not due to general phonological rules). For instance, HUNGER is modified by the -Y, so that HUNGER + Y = HUNGRY

b. Sentence length can be measured in various ways.
   1) In a Microsoft Word document they are measured in words.
   2) Morphemes
   3) Syllables
   4) Letters

c. Increased sentence length is a measure of growing language ability.
   Linguists prefer to use morphemes as the unit of measurement. Therefore they have the Mean Length of Utterance in morphemes. **[MLU**] 'upstairs' = 3 morphemes. 'I hungry' = 3 morphemes. Sometimes the following are used:
   MLUw words
   MLUm morphemes. See Yip and Matthews ch3.

2. Grammatical morphemes in English

a. Absent in early speech. Children use word order to convey meaning.

b. As MLUm approaches 2.5, past tense, plural inflection, prepositions such as 'in' and 'on' begin to appear.

c. The questions are:
   1) is there a relationship between frequency (how common a morpheme is) and order of acquisition? Arguable, probably. It is not just a matter of frequency.
   2) is there a relationship between linguistic complexity and order of acquisition? Probably yes.

3. Normal development

. As sentence length increases, we start seeing grammar. Remember the process:

a. Individual examples are learned, therefore even irregulars are perfect. For instance 'he went'

b. Rules formed, and all examples twisted to fit the rules. For instance 'he goed'.

c. There are rules with exceptions.

Commonly the irregular is learnt first, then the rule forces the regular form, then the irregular re-appears. This suggests that there are two mechanisms at play. Rule formation, and memorisation of exceptions.

Adults do not need to go through this process. Learning can be speeded up by going directly to point c. rules + exceptions

NB This is a pattern that repeats itself in many areas of learning.

4. In general, language acquisition is related to:

a. frequency of exposure to the language

b. the difficulty of the language - the linguistic complexity. Children begin with the simple and advance to the more complicated.

5. Clark Chapter 11, Compounding and derivation

a. In English compounds:

1) Root compounds eg sun-rise, push-chair
2) Compound adjectives eg grey-eyed
3) Compound verbs eg to side-step, to dry-clean
4) They may also combine affixes and roots as in synthetic compounds such as clock-mender or washing-machine.
5) Compound nouns like snow-flake contain a head (flake) and a modifier of the head (snow). Note how the head contains a marker for number, and in many languages could contain a marker for case and gender.
6) In English the head is always last in the term and primary stress is on the modifier.
7) Compound verbs, the head contains tense, aspect, agreement for person, agreement for number and in some languages agreement for gender.

b. In English derivatives

1) Affixes can maintain (re-draw) or change (hospital-ize) the word class.
2) Group I affixes eg -ous, -ive -ify. These often change stress and pronunciation pattern
3) Group II affixes have little effect on the root eg -ness, -less, -er
4) Group I affixes are usually added to a root before Group II affixes
5) In English, can be achieved by a shift of word class. Sometimes called zero derivation or conversion.

c. Coinage

a. Young children have a small vocabulary. Therefore they coin their own words and in doing so make use of familiar roots and affixes

b. There are considerable individual differences in the extent of coinage.

c. Children typically master certain root compounding patterns before any derivational affixes and derivational patterns. They make use of zero derivation before affixes. They pay attention first to those patterns that are productive in adult speech.

d. Transparency of meaning, simplicity of form

1) The meaning of a complex word is transparent when children already know the meaning of the components. eg pain-killer vs analgesic.
2) There are obvious problems where an affix has more than one sense eg -er.
3) The initial assumption is no allomorphs ie simplicity of form

e. Affixes

1) By age 2.5 children start using affixes, in English, usually beginning with suffixes such as the diminuitive -ie
2) Another early affix is un- for verbs.

Clark EV (nd). downloaded 2007.
Morphology in language acquisition. In Spencer AD & Zwicky A (eds) Ch19. *The handbook of morphology*. Blackwell, USA.

1. Reasons for delay in mastery of morphology

a. some meaning distinctions appear to be more complex conceptually than others, and so take longer to learn;
b. some paradigms are less regular than others, and they too take longer to learn;
c. language typology may affect the process of morphological acquisition: suffixes, for instance, are acquired more readily, and earlier, than prefixes.

2. In order to acquire noun and verb morphology,
children must first analyze the structure of words heard in input, identify stems and affixes, map consistent meanings onto them, and then begin to use those stems and affixes in new combinations. This process of analyzing form and assigning meaning is a prerequisite for the acquisition of inflectional morphology. It is also a prerequisite in the acquisition of word formation. Children begin to use some word-formation processes at around the same time as their first inflections. In particular, they produce novel compounds formed from simple stem combinations (often called root compounds). Next, during their second year of speech, as some inflectional paradigms become established, they also begin to produce a few derivational affixes in novel word forms. These emerge in greater numbers between ages three and four, in both derived and compound innovations.

3. Most of the evidence has come from **longitudinal records** of the speech of children

4. The order in which children acquire inflections has been studied in some detail for grammatical morphemes in English (R. Brown 1973, Cazden 1968). There, the best predictor of relative order is semantic complexity, with morphemes that are cumulatively more complex being acquired later. A morpheme marking x is acquired before one that marks x + y, and so on. This is consistent with Slobin's (1973) identification of conceptual complexity as one major determinant of overall order of acquisition. What has not been established is a general conceptual base for measuring the complexity of specific morphological distinctions within or across languages.

5. A second major determinant of order of acquisition in production is formal complexity in the expression of a specific meaning.

6. Case marking
In languages with case marking, children typically begin with just one form of each noun, generally the nominative or the accusative. Contrasting cases on the same noun in some languages begin to appear very early (around twelve to fourteen months), in others a few months later. One determinant appears to be the nature of the case system: where a single affix serves all forms of nouns, children master the case contrasts much faster, even with phonological conditioning, than where the forms of each case ending vary with the gender and number of nouns.

NB. History of English, here, if not done already

6. The first contrast acquired seems to be between the nominative and accusative cases, associated with subject and direct object respectively. Contrasting uses of cases may appear with single-word utterances. In two-word combinations, where word order may offer no clues, case can distinguish the object of a transitive verb from the subject of an intransitive one. As children add other cases such as the dative and genitive, these too serve to distinguish direct objects, for example, from indirect objects (e.g. recipients and possessors) from the two-word stage on. In general, acquisition of nominative and accusative cases is followed by the remaining oblique cases. This may involve only two or three other cases in a language like German, versus many other case forms in one like Finnish.

7. **Several factors make case difficult to learn.**
   The most notable may be the number of forms that children have to deal with in some languages. For example, both gender and number interact with case. In a two-or three-gender language, there are typically multiple affixes for each case. And within each gender, languages may have several noun paradigms, with each paradigm identified by the phonological shape of the root or stem. Children have therefore to deal with several different affixes as they learn how to express each case in a language.

   When it comes to number, they also have to deal with the fact that some gender distinctions in the singular forms are lost in the plural. In fact, children tend to learn first how to mark case in the singular, and only later in the plural.

   Languages differ, therefore, in the number of affix shapes to be learnt for each case, as well as in the number of cases – from a minimum of two or three to more than twenty.

   Where more shapes are associated with a particular case, children are more likely to opt initially for just one affix shape to mark a particular case on every stem. This reliance on a single affix shape, regardless of gender and number, has been dubbed "**inflectional imperialism"** (Slobin 1973). What this does is allow children to mark case with some consistency prior to the acquisition of gender or of subparadigms within genders.

   In languages where case affixes are invariable, or vary only, say, with vowel harmony, children acquire adult-like case marking very early, typically before the age of two – for example, in Turkish and Hungarian.

   In languages where case interacts with gender and number, children acquire the full system of case marking, with all the different affix shapes, much more slowly, and may still make some errors as late as age five or so – for example, in Russian.

   Adult- like case marking may also take more time in languages where complex morphophonological rules obscure stem-affix boundaries, and so make it harder for children to identify stems and affix shapes. Form, and in particular the range of forms for each affix, depending on gender and noun paradigms within genders, is a major determinant of how long children take to acquire adult-like case marking.

8. Person, number and gender

Verbs are generally marked for person and number, and in some constructions and tenses for gender. The earliest verb forms used are typically third-person singular present, imperative, or infinitive in form. Children may focus on one or more of these as their earliest verb form(s), depending on the language being acquired. For example, in English, the first-or second-person present, the imperative, and the infinitive are all realized as an uninflected or zero- affix form of the stem, while the third- person singular present is marked by -s. Children begin with the uninflected form, and only later mark the third-person verb form in the present.

The initial form favored by children differs somewhat with language, with choices converging on an imperative form alongside some present-tense form, often in the third person.

Number is marked in both verbs and nouns. In verbs, the plural forms are typically learnt some time after their singular counterparts. That is, children usually learn the singular forms for all three persons (first, second, and third) before they master the plural ones in languages that distinguish person and number in the verb. Number is mastered earlier in the noun than in the verb, and typically begins to be marked before age two.

The distinction between one versus more than one may be signaled nonconventionally at first through modifiers such as more or a numeral (e.g. English more book for '(several) books', or two magnet for '(many) magnets'). Then children begin to add the regular plural affixes to nouns and to over-regularize irregular plurals.

Irregular forms may take many years to master, with children continuing to make errors in their plural inflection as late as age twelve, as in Egyptian Arabic (Omar 1973). This shows that the formal complexity, in terms of the number of plural affixes and the conditions on their use, affects the point of acquisition for children. The smaller the number of affixes to be acquired in marking a distinction like plural number, the easier it is for children to master the adult options.

Here again, factors related to the forms of gender marking appear to be an important determinant of how early and how easily children acquire gender marking.

Where gender is marked consistently, with the same affix, for example, on the noun and on any adjective modifying that noun, children seem to find it easier to acquire.

The same goes for gender marking in the plural: consistency in the form across nouns of the same gender, plus use of the same affix on adjectives and even verbs marked for that gender, makes for earlier acquisition, as in Hebrew (Levy 1983).

But where form offers a less clear guide to gender marking, children take longer to master gender, and may rely initially on semantic rather than formal factors in adding the pertinent affixes, as in Icelandic (Mulford 1985).

9. Tense and aspect

The first tense contrast that children seem to introduce is that between present and nonpresent. The first nonpresent inflections usually mark completed, hence past, actions; but they may also mark future time. (In similar fashion, two- year-olds often use yesterday to mark either past or future (e.g. Decroly and Degand 1913, Harner 1975).) Slightly older children, around age four, commonly choose past-tense forms to mark irrealis. They do this in pretend play, for example, when assigning roles and planning future series of actions, as in the following exchange which preceded the relevant acting-out.

After acquisition of the initial present/nonpresent contrast, children add other tense inflections to mark the future and to distinguish past forms for background versus foreground events (typically, imperfect versus perfect forms). Some tenses such as the present perfect may not be fully mastered until age four to five, but the basic present/past/future contrasts are generally well established by around age three.

10. Agreement

One basic function of inflectional systems is to indicate which elements in an utterance "go together." One finds agreement in number, person, and sometimes gender, for example, between a subject noun phrase and the verb, and agreement in number and gender between nouns and adjectives that modify them. There can also be agreement between articles or demonstratives and the nouns they go with – in gender, number, and case – and between pronouns (independent, possessive, or relative) and their antecedents – again in gender, number, and case.

Agreement markers therefore help group together those elements that belong together for semantic and grammatical purposes. The acquisition of inflections must be measured, therefore, not just by the acquisition of specific paradigms, but also by children's use of agreement more generally.

Overall, children appear to rely on phonological cues to gender and gender agreement. In French, for instance, children omit articles at the one-word stage, and they make some errors in their choices of article early on. But phonological form in French is correlated with gender (masculine or feminine), and children quickly become sensitive to such cues.

In one elicitation study, where phonological form and natural gender were correlated, even the youngest children (aged three), having heard an indefinite article, produced the appropriate definite article nearly all the time. With phonological cues only, they did equally well; but with neither phonological clues in the shape of the word nor information about natural gender, they made errors in their choice of definite articles about 20 percent of the time. Where indefinite articles and word shapes conflicted (e.g. a feminine article with a masculine word shape), children up to six would change either the article or the noun shape to make the two agree (e.g. le bicronne would be changed to la bicronne or le bicron). Older children also took account of the natural gender of the dolls being labeled and assigned feminine articles and word shapes for female dolls (Karmiloff-Smith 1979).

11. Typology (structural similarities) and acquisition

Children's patterns of acquisition suggest that they can process some kinds of information more readily than others. For example, they consistently learn suffixes before prefixes, even when these express equivalent information.

12. Word formation

As children learn more words, storing them in memory and producing them themselves, they come to analyze their internal morphological structure. They begin to identify roots and stems inside complex words, in both compound and derived forms, and simultaneously isolate any derivational affixes attached to those roots. Such analysis is a prerequisite for new-word formation. And children do form new words, starting as young as age eighteen months to two years. In English, for example, they construct compounds and form verbs from nouns with no affixation. In the next few months (two and a half to three), they come to use affixes as well in the construction of new words.

Languages differ in the options they offer for coining new words. Some languages rely extensively, or even exclusively, on compounding; others rely mainly on derivation; and others rely on both. Are some options acquired more easily than others? **If so, children learning different language types should follow different routes in their acquisition of word formation.** The sections that follow review first what is known about children's acquisition of derivational options in word formation, and then their acquisition of compounding. **Overall, children begin to use inflectional morphology before they coin new word forms**, although there is considerable overlap in some languages. But **derivational affixes in general begin to emerge later than inflectional ones.**

Lastly, when children coin new words, they fill semantic gaps. Children do not wait until they have learnt the appropriate word before they try to express a particular meaning. Instead, when they need to, they construct a form for the meaning they want to convey. In doing this, they observe two general constraints on the coining of new words.

- Conventional words – forms that express meanings agreed on by the language community – take priority.
- If a word is already known to the child for the pertinent meaning, that is the word they use. And there is then no reason to coin another word with the selfsame meaning. New words must therefore contrast in meaning with existing words within any semantic domain (Clark and Clark 1979; Clark 1990, 1993).

- These two assumptions appear to be observed by both children and adults.

13. Derivation

Evidence that children are using derivation comes from their construction of novel words. To use an affix appropriately, for example, requires children to have analyzed that affix in established words and to have assigned it some meaning before they can use it in constructing new words.

The first novel derived forms children construct are derived with no affix. Somewhat later, around age three, they begin to produce an increasing number of novel forms with affixes.

Children coin new verbs in English from around age two. They form them mainly from nouns but also, on occasion, from adjectives, as in to scale ‘weigh’, to key ‘insert a key’, to sand ‘grind’, or to water ‘paddle in water’. Such verbs require no affixation to indicate the change from noun to verb: they need only the appropriate suffixes and syntax (Bowerman 1974, Clark 1982, Maratsos et al. 1987). In effect, children are **exploiting a zero-derivation option** when they construct new verbs from familiar nouns. This effectively allows them to form new words from words with meanings already known to them, and to do so without having to make any changes in form.

Children rely on certain general principles as they analyze word forms and then construct new words themselves.

- They attend to the **transparency** of the components used; that is, they make use only of elements whose meanings they already know. This would account for why they initially rely on zero derivation, making use of stems or roots of familiar words. Only once they have assigned some meaning to an affix, do they begin to use that too in constructing new words.
- They also attend to the **simplicity** of the form produced; the fewer the changes to be made in the component elements, the easier it is to construct and produce. This again would lead children to favor zero derivation early on. And they are sensitive to the productivity of the affix being used; they follow adult usage in favoring the most productive option first, unless there is some reason not to (Clark 1993).

- There is strong evidence that children analyze affixes and assign some meaning to them some time before they start to produce them themselves.

14. Compounding

In some languages, children begin to construct new compounds from as young as one and a half; in others, they make little use of novel compounds before age six or seven. The difference, in general, appears to depend on whether or not compounding is productive within the language. In addition, children are attentive to the transparency and simplicity of the elements they use in compounding. As a result, their earliest compounds typically consist of combinations of familiar bare nouns which are both transparent in meaning and simple in form (root compounds). It is only later that they begin to use affixes or produce any adjustments in form required for specific types of compounding in the language.

Children learning Germanic languages construct root compounds from an early age, often before age two. They form them mainly from familiar nouns, as in English crow-bird (one year, seven, months, for 'crow'), oil-spoon (one year, eleven months, 'spoon for cod-liver oil'), or coffee-churn (two years, 'coffee-grinder')

And, by age two to two and a half, children have learnt to identify the modifier and head in such root compounds.

But children acquiring languages that make less use of compounding do not produce compounds at this age. For example, children acquiring Romance languages produce virtually no root compounds until around age five or later (Clark 1993).

Children rely on transparency and simplicity in their novel compounds just as much as in their derived words. Their earliest compounds are all root compounds, typically forms from two or more 'bare' nouns already known to them. They begin to form novel synthetic compounds only later, after analyzing and assigning some meaning to suffixes such as the English agentive -er. This sequence is predicted by both transparency of meaning and simplicity of form.

15. Conclusion

In general, children start to acquire inflections before they begin on novel- word formation. The earliest noun and verb inflections to emerge appear in some languages before age one and a half. Compounding with no affixation emerges soon after the first inflections, but novel derived forms do not emerge until after age two. The first to appear are zero-derived forms with no affix.

Then come some derivational affixes, with sporadic use up to age three, followed by more extensive use from age three or four on. In languages that make little use of compounding or zero derivation, therefore, the first novel-word formations may not appear until age three or later. It is unclear whether typology affects the acquisition of morphology elsewhere. Although it appears easier to process suffixes than prefixes, there are too few data on the acquisition of prefixing languages to see how consistently this holds overall. At the same time, children acquire locative affixes, for example, much earlier in languages that use invariant forms on all stems than in languages that rely on a mix of case marking (varying in form with gender and number) and prepositions. It may be easier in general, then, for children to map inflectional meanings in agglutinative than in synthetic languages.

Overall, the sequence of acquisition for morphology, whether in inflectional systems or in word formation, appears to depend on at least two factors: the complexity of the meaning being expressed – where children have to discover this for each affix – and the complexity of the form to be used – where children have to work out the conditions that govern different allomorphs. However, what counts as easy versus difficult in adjusting the form of a word is not easily measured.

In short, children work with words. Their earliest inflections are typically learnt as parts of words, and only later are analyzed for forms and meanings. Once this is done, children appear able to extend paradigms with rule-like application of an affix to new instances. In doing so, they also regularize irregular forms until they learn to produce the appropriate irregular forms. This holds for both inflections and word formation.

E. DEVELOPMENT OF SYNTAX

1. Early Grammar

a. Children begin word combinations by age 2 (pivot grammar) and commonly use two words eg 'I hungry'. The features learnt depend on the language (English: attention to word order, Turkish, attention to word endings) there are important cross-language similarities. MA thesis!!

b. Studies of many languages have shown that there is a basic child grammar.

c. Evidence clearly shows that comprehension is ahead of production.

2. Modulating word meanings Clark ch 8

a. Words are usually modified eg inflections, linked eg prepositions, or qualified etc. Languages differ significantly in the actual mechanisms.

b. The cumulative complexity of semantic distinctions makes the best predictions about the order of acquisition (Clark 183).
   Eg. -ed refers to 'earlier in time'
   were refers to earlier in time AND number
   Therefore -ed is learned before were

c. Frequency

1) Allomorph. One of a set of forms that a morpheme may take in different contexts 'the -s of cats, the -en of oxen, and the zero suffix of sheep are allomorphs of the English plural morpheme.
2) Children are most sensitive to the productive allomorphs since they occur in many kinds of words.
3) Children are more sensitive to type frequency than to token frequency. They are more likely to use the inflections that appear on many stems than those that occur on only a few. (Clark 185).
4) BUT, not always. Frequency overlaps with the memorise for a few/rule for many. There are also language differences.
5) "...early on, children attend to those inflections represented across the greatest number of types to which they have been exposed. But as they learn more of their language ... they must also pay attention to those tokens that they hear frequently but on very few types" (Clark 186).

Children will learn first the most common forms of morpheme. Simple — > complex

2. Later grammar (English)

a. Negation - mastered relatively late - in the early teens.
b. Passive - difficult for preschool children. See Carroll ch 11.

Note how grammar is related to conceptual development. Again!

3. In English, it is word order, in Turkish it is word endings (inflections).

Carroll p269. "It is difficult to uncover a simple grammar for early development that is based on syntactic factors alone. An additional problem is that the order of words in early utterances is not always consistent".

These grammar patterns are related in part to the maturational process, and the 'readiness to learn'. NB this concept of readiness is very important. For instance, some children are ready to learn to read and write at the age of four. Others are still not ready at the age of six. Children who are not ready and who are forced to learn will be set back in their learning and might well develop resistance to learning. It is one of the tasks of a primary school teacher to sense this readiness, and to decide the cause of any reluctance to learn. Is it rebellion which needs discipline? Is it lack of readiness, which means the child should not be forced? Is it due to dyslexia, in which case the child will respond better to a different teaching methodology?

3. **Children follow similar paths as they master the inflectional forms**
   - They take longer to learn inflectional systems that use many variants
   - These variations are made more complicated by their link to conceptual complexity

4. **Clark chapter 9**
   a. Children rely on formulaic utterances (p211).
   b. Read the rest of the chapter yourself.

F: Maturation

1. **Summary of Piaget**

ATHERTON J S (2010) Learning and Teaching; Piaget's developmental theory [On-line] UK: Available: http://www.learningandteaching.info/learning/piaget.htm Accessed: 8 November 2010 [Modified in places to improve the clarity]

Jean Piaget (1896-1980) was a biologist who originally studied molluscs (publishing twenty scientific papers on them by the time he was 21) but moved into the study of the development of children's understanding, through observing them and talking and listening to them while they worked on exercises he set. "Piaget's work on children's intellectual development owed much to his early studies of water snails" (Satterly, 1987:622)

His view of how children's minds work and develop has been enormously influential, particularly in educational theory. His particular insight was the role of maturation (simply growing up) in children's increasing capacity to understand their world: they cannot undertake certain tasks until they are psychologically mature enough to do so. His research has spawned a great deal more, much of which has undermined the detail of his own, but like many other original investigators, his importance comes from his overall vision.

He proposed that children's thinking does not develop entirely smoothly: instead, there are certain points at which it "takes off" and moves into completely new areas and capabilities. He saw these transitions as taking place at about 18 months, 7 years and 11 or 12 years. This has been taken to mean that before these ages children are not capable (no matter how bright) of understanding things in certain ways, and has been used as the basis for scheduling the school curriculum. Whether or not should be the case is a different matter.

2. Piaget's Key Ideas

Adaptation	What it says: adapting to the world through assimilation and accommodation
Assimilation	The process by which a person takes material into their mind from the environment. Merging. The process of using or transforming the environment so that it can be placed in preexisting cognitive structures.
Accommodation	In response to new ideas, the existing held ideas are adjusted, changed, modified. It is the process of changing cognitive structures in order to accept something from the environment. Both processes are used simultaneously and alternately throughout life. An example of assimilation would be when an infant uses a sucking schema that was developed by sucking on a small bottle when attempting to suck on a larger bottle. An example of accommodation would be when the child needs to modify a sucking schema developed by sucking on a pacifier to one that would be successful for sucking on a bottle. Note that assimilation and accommodation go together: you can't have one without the other.
Classification	The ability to group objects together on the basis of common features.
Class Inclusion	The understanding, more advanced than simple classification, that some classes or sets of objects are also sub-sets of a larger class. (E.g. there is a class of objects called dogs. There is also a class called animals. But all dogs are also animals, so the class of animals includes that of dogs)
Conservation	The realisation that objects or sets of objects stay the same even when they are changed about or made to look different.
Decentration	The ability to move away from one system of classification to another one as appropriate.

Egocentrism The belief that you are the centre of the universe and everything revolves around you: the corresponding inability to see the world as someone else does and adapt to it. Not moral "selfishness", just an early stage of psychological development.

Operation The process of working something out in your head. Young children (in the sensorimotor and pre-operational stages) have to act, and try things out in the real world, to work things out (like count on fingers): older children and adults can do more in their heads.

Schema (or scheme) The representation in the mind of a set of perceptions, ideas, and/or actions, which go together.

Stage A period in a child's development in which he or she is capable of understanding some things but not others

3. The four development stages

Sensori-motor (Birth-2 yrs)

** Differentiates self from objects
** Recognises self as agent of action and begins to act intentionally: e.g. pulls a string to set mobile in motion or shakes a rattle to make a noise
** Achieves object permanence: realises that things continue to exist even when no longer present to the sense (pace Bishop Berkeley)
** Children experience the world through movement and senses (use five senses to explore the world). During the sensorimotor stage children are extremely egocentric, meaning they cannot perceive the world from others' viewpoints. The sensorimotor stage is divided into six substages: "(1) simple reflexes; (2) first habits and primary circular reactions; (3) secondary circular reactions; (4) coordination of secondary circular reactions; (5) tertiary circular reactions, novelty, and curiosity; and (6) internalization of schemes."

Preoperational stage: from ages 2 to 7

** Imaginary thinking predominates.
** Acquisition of motor skills.
** Egocentrism begins strongly and then weakens.
** Learn to use language and to represent objects by images and words
** Thinking is still egocentric: a child has difficulty taking the viewpoint of others
** Classifies objects by a single feature: e.g. groups together all the red blocks regardless of shape or all the square blocks regardless of colour

Concrete operational stage: from ages 7 to 12

** children begin to think logically about events and objects: they are very concrete in their thinking.
** Children can now conserve and think logically but only with practical aids.
** They are no longer always egocentric.
** Achieves conservation of number (age 6), mass (age 7), and weight (age 9)
** Classifies objects according to several features and can order them in series along a single dimension such as size.

Formal operational stage: from age 12 onwards (development of abstract reasoning).
** Children develop abstract thought and can easily conserve and think logically in their mind.
** Can think logically about abstract propositions and test hypotheses systematically
** Becomes concerned with the hypothetical, the future, and ideological problems

Piaget's research methods were based primarily on **case studies** [they were descriptive].Piaget believed that biological development drives the movement from one cognitive stage to the next. Data from **cross-sectional studies** of children in a variety of western cultures seem to support this assertion for the first three stages (Renner, Stafford, Lawson, McKinnon, Friot & Kellogg, 1976). But studies of adolescents do not support the assertion that all individuals will automatically move to the next cognitive stage as they biologically mature. Only 30 to 35% of high school seniors attain the stage of formal operations (Kuhn, Langer, Kohlberg & Haan, 1977). For formal operations, it appears that maturation establishes the basis, but a special environment is required for most adolescents and adults to attain this stage.

4. Brief evaluation

The accumulating evidence is that this scheme is too rigid: many children manage concrete operations earlier than he thought, and some people never attain formal operations (or at least are not called upon to use them).

Piaget's approach is central to the school of cognitive theory known as "cognitive constructivism": other scholars, known as "social constructivists", such as Vygotsky and Bruner, have laid more emphasis on the part played by language and other people in enabling children to learn.
And the combination of neuroscience and evolutionary psychology is beginning to suggest that the overall developmental model is based on dubious premises. (It's too early to give authoritative references for this angle.)

Wrestling with Jean Piaget, my Paragon http://www.edge.org/q2008/q08_1.html#gardner

1. Like many other college students, I turned to the study of psychology for personal reasons. I wanted to understand myself better. And so I read the works of Freud; and I was privileged to have as my undergraduate tutor, the psychoanalyst Erik Erikson, himself a sometime pupil of Freud. But once I learned about new trends in psychology, through contacts with another mentor Jerome Bruner, I turned my attention to the operation of the mind in a cognitive sense — and I've remained at that post ever since.

2. The giant at the time — the middle 1960s — was Jean Piaget. Though I met and interviewed him a few times, Piaget really functioned for me as a paragon. In the term of Dean Keith Simonton, a paragon is someone whom one does not know personally but who serves as a virtual teacher and point of reference. I thought that Piaget had identified the most important question in cognitive psychology — how does the mind develop; developed brilliant methods of observation and experimentation; and put forth a convincing picture of development — a set of general cognitive operations that unfold in the course of essentially lockstep, universally occurring stages. I wrote my first books about Piaget; saw myself as carrying on the Piagetian tradition in my own studies of artistic and symbolic development (two areas that he had not focused on); and even defended Piaget vigorously in print against those who would critique his approach and claims.

3. Yet, now forty years later, I have come to realize that the bulk of my scholarly career has been a critique of the principal claims that Piaget put forth. As to the specifics of how I changed my mind:

4. Piaget believed in general stages of development that cut across contents (Space, time, number); I now believe that each area of content has its own rules and operations and I am dubious about the existence of general stages and structures.

5. Piaget believed that intelligence was a single general capacity that developed pretty much in the same way across individuals: I now believe that humans posses a number of relatively independent intelligences and these can function and interact in idiosyncratic ways,

6. Piaget was not interested in individual differences; he studied the 'epistemic subject.' Most of my work has focused on individual differences, with particular attention to those with special talents or deficits, and unusual profiles of abilities and disabilities.

7. Piaget assumed that the newborn had a few basic biological capacities — like sucking and looking — and two major processes of acquiring knowledge, that he called assimilation and accommodation. Nowadays, with many others, I assume that human beings possess considerable innate or easily elicited cognitive capacities, and that Piaget way underestimated the power of this inborn cognitive architecture.

8. Piaget downplayed the importance of historical and cultural factors — cognitive development consisted of the growing child experimenting largely on his own with the physical (and, minimally, the social) world. I see development as permeated from the first by contingent forces pervading the time and place of origin.

9. Finally, Piaget saw language and other symbols systems (graphic, musical, bodily etc) as manifestations, almost epiphenomena, of a single cognitive motor; I see each of these systems as having its own origins and being heavily colored by the particular uses to which a systems is put in one's own culture and one's own time.

10 Why I changed my mind is an issue principally of biography: some of the change has to do with my own choices (I worked for 20 years with brain damaged patients); and some with the Zeitgeist (I was strongly influenced by the ideas of Noam Chomsky and Jerry Fodor, on the one hand, and by empirical discoveries in psychology and biology on the other).

11 Still, I consider Piaget to be the giant of the field. He raised the right questions; he developed exquisite methods; and his observations of phenomena have turned out to be robust. It's a tribute to Piaget that we continue to ponder these questions, even as many of us are now far more critical than we once were. Any serious scientist or scholar will change his or her mind; put differently, we will come to agree with those with whom we used to disagree, and vice versa. We differ in whether we are open or secretive about such "changes of mind": and in whether we choose to attack, ignore, or continue to celebrate those with whose views we are no longer in agreement.

Notes from Handbook of Psychology 2003. Vol 6 Chapter 8: Cognitive development in Childhood

The main problems with the theory can be summarized as follows:

1. The theory claimed that cognitive development was universal but would not specify the role that maturation plays in the process.

2. The theory proposed that each stage of cognitive development was a complete system—a structured whole available to the growing child as she or he moved into that stage. Yet empirical results indicated again and again that children were unable to carry out many of the tasks characteristic of a given stage, leading to charges that the theory invoked an "immaculate transition" that happened but could not be seen.

3. Related to the previous point is that other than proposing a six-phase substage sequence for sensorimotor behavior, the subsequent three large-scale stages of the theory had little internal order. This problem gets worse with each stage because each stage increases in the number of years it encompasses—from 2, to 4, to 6, to at least 8.

4. Formal operations, the final stage according to the theory, seemed not to be achieved by many adults.

5. A number of researchers claimed that stages beyond formal operations exist and needed to be added to the theory.

6. There was widespread dissatisfaction with the equilibration process as an explanation for qualitative shifts from stage to stage.

**7. The theory seemed to depend too much on logic as both a framework for describing cognitive structures and as an ideal toward which development was supposed to be aimed. Areas of development that were not centrally logical (art, music, drama, poetry, spirituality, etc.) seemed to be largely beyond the theory's compass.

8. The methods that the Genevan school favored, although appropriate for exploratory research, lacked the rigor and systematic techniques of traditional experimental science. Its claims were made at such a broad and general level that it was often difficult to put them to rigorous test .

**9. The theory did not deal with emotions in any systematic way.

**10 The theory did not deal with individual differences, individuality, or variability.

11 The theory implied that progress was a natural and inevitable reality of cognitive development, an assumption that seemed to be more and more a relic from the nineteenth century.

12 The theory gave little role to cultural, social, technological, and historical forces as major influences on cogni- tive development. In particular, it seemed to paradoxically both inspire educational reform and at the same time offer no important role for educators.

13 As a theory that aims to be suitable for formal analysis, Piaget's framework was found to have serious flaws conceptually, logically, and philosophically.

The main alternative to Piaget is Vgotsky

The main features of the Vygotskiian-Russian revolution are an emphasis on shared participation in culturally valued activities, recognition that cultures vary in what kinds of skills and abilities are valued, the importance of culturally constructed and preserved tools and technologies as key to cognitive development, and—in striking contrast to Piaget—the absolutely central role in human cognitive development of language.

There is less of an either-or quality to the discussion about the role of nature versus nurture in developmen. It is also more widely accepted that biological aspects must be under- stood as vital to the process of cognitive development. At the same time, the Piagetian assumption is ever more widely accepted that humans construct their own systems for representing and understanding the world and their experience of it.

The acquisition of speech is now understood to be a remarkable human adaptation, the investigation of which is central to understanding human cognitive development.

It is also understood that language, with its powerful evolutionary and natural underpinnings, is constructed through a complex set of processes that are individual, social, cultural, and contextual. Contemporary researchers in language development reflect this trend to draw upon several traditions (Piagetian, Vygotskiian, evolutionary, nativist, computational) to build their frameworks for interpreting language development.

G. DEVELOPMENT OF SEMANTICS See also Foster p78ff, and Harley ch 11 and Clark ch 6.

1. Children's semantic development is dependent upon their conceptual development. Probably, for instance, the ability to categorise is innate. In point-and-name (very common) what aspect of the object is being labelled? Adults are sensitive to the problem and give the most useful word, usually the word for the whole object.

2. Later, when vocabulary and conceptual development permit, it is possible to qualify any description, and explain with little definitions. (sort of, kind of, it is like).

3. Huge importance: the social setting for language development. Because this varies, with individual differences, this multiplies the complexity. It is hard to generalise.

4. **Individual differences are the norm.** Children appear to vary in the importance they assign to different concepts, and this leads to individual differences and preferences for learning words. Eg the first use of 'dog' varies from, four legged mammal shaped objects, to all furry objects (including hats and coats) to all moving objects. In each case though the same mechanism operates: hypothesis and try it out. Children work by trial and error, they make hypotheses and test them out, and learn from their mistakes.

5. Superordinates seem difficult to acquire, eg table is easy, furniture not. Ring is easy, jewelry not. Is this a problem of categorising? This is not so for L2 learners, though they do have problems with faux amis. Eg, in L2, if the detailed word 'table' is not known, one can have this dialogue. "Table? What does this mean, table?" "a kind of furniture".
   a. **Whole object assumption**
      Children (age 1.5ff) assume a label refers to the whole object, not part of it.

   b. **Taxonomic assumption** ie a category not a cluster. Eg dog refers to an animal, not to dogs fighting cats, or dogs barking

   c. **Basic level assumption**
      dog, not animal or Alsatian.
      1) Basic level categories cohere internally so that their members are readily perceived both as members of their category and as distinct from nearby categories. (Clark p125).
      2) Linguistically, the forms are usually simpler
      3) Once learned within a conceptual domain, a child will look for a similar pattern elsewhere eg 'cat' refers to cats in general, not a specific group of cats.

   d. **BUT**
      1) Adults do not always provide basic level words
      2) It is clear that some form of constraints operate, but the details are not clear. see Clark p128 for details.
      3) The pragmatics is extremely important, and is often neglected.

6. There are syntactic clues to word meaning. Age 17 months, children begin to use parts of speech as a clue. eg 'This is Sib' and 'this is a sib' (count noun).

7. Theories

a. **Prototype hypothesis** ie typical example, which must be close to the adult idea. Strongest theory. Contrasts are important eg 'dog' in contrast to similar animals such as cats. Children begin with this approach. Adults also work this way, recognising typical (representative) examples. When adults are not sure then they turn to the details and the features and they make an analysis.

b. **Semantic feature hypothesis** (Harley 363ff).
Over and under extensions happen as a result of a mismatch between the child and adult representation. Semantic development means the learning of new features, and eliminating false ideas. Problems with this are technical. see p364. Cp Faux amis. **It is a useful tool for studying.**

Adults know that a pen is made of plastic, has ink inside, and they know the size and shape. Adults know that a pencil is made of wood, has carbon/lead inside, and the size and shape. For both of them they know the use. When adults are not sure of the name of something, they are capable of analysing it to decide on the label.

A good example of this is if a spider is to be called an insect. It has an exoskeleton, lays eggs, and generally behaves like an insect. But it has eight legs, and biologists classify it differently. The whole system of biological classification is based upon the features of the life form in question.

8. **Later development of meaning**

a. Children stop over-extending, age 2½. At this point they start asking questions about names.

b. Words with simpler semantic representations are acquired first. eg order of dimensional terms used to describe size.

big - small	Common, broader words first
tall - short,	
long - short	
high-low	
thick-thin	
wide-narrow,	
deep-shallow.	Less common. The wide-narrow terms are very context specific.

cp also: fat-thin. plump, overweight, obese.

H. DEVELOPMENT OF PRAGMATICS (Foster 53-62). Strongly influenced be Halliday, (functional grammar), then speech act theory. NB this topic seems to be neglected in Carroll etc.
See Steinberg chapter 3, Reading. Clark chapter 6.

Principle 1: Conventionality.
Speakers agree on and assume there are conventional forms and give them priority when communicating.

Principle 2: Contrast.
Speakers assume that any difference in form signals a difference in meaning.

1. Halliday

a. Halliday studied the communicative development of his son Nigel. Age 9 months possessed four functions.
   Function 1) **Instrumental**, to satisfy needs
   Function 2) **Regulatory**, to control the behaviour of others
   Function 3) **Interactional**, me and you
   Function 4) **Personal**, expressing self-uniqueness

   Simple -> complex.

b. By Age 1, each of the above functions had several different sub-functions (more elaborate). (p55).
   eg Personal. 4) above ->
   a) General interest in participation
   b) Comment on objects
   c) Expression of pleasure
   d) Withdrawal

c. By 18 months, two new functions have emerged:
   Function 5) **Imaginative** (pretend play, rhymes) ie use of communication devices to create an environment. **Explain the importance of play (even for adults).** "All work and no play makes Jack a dull boy".

   Function 6) **Heuristic** (request for information, acknowledgement, imitating) ie the use of communicative devices to find out about the world. 'Tell me why...>

d. Around 20 months another function emerges
   Function 7) **Informative**
   Q. How does this differ from the other functions?
   Ans: the first which MUST be carried out with words, because it is used to convey information about things not visible in the immediate environment. At the beginning, gestures dominate, then words take over, then there is the use of words only.

e. Thence follows the emergence of adult vocabulary. Which means a wider range of expressions, and combining of functions. Also, adolescents learn politeness strategies.

f. By age 4 children can cope with using a referent in three different ways eg a rose, a plant, and a flower.

2. Speech act theory

a. Researchers such as Bates and Dore have developed taxonomies of illocutionary acts (ie contains a communicative intention, performative verbs) to apply to communications before conventional language has emerged, something which was not warranted within the original theory, but has proved extremely useful.

b. Gestures/intonation. The earliest illocutionary acts are 'proto-imperatives' and 'proto-declaratives'. (proto = beginner, cp prototype ie try it out). (Foster 59 for examples). First and real requests appear around 8 months. This is a short example.
C is seated in a corridor in front of the kitchen door. She looks toward her mother and calls with an acute sound 'ha'. M comes over to her and C looks toward the kitchen... M carries her into the kitchen and C points towards the sink. M gives her a glass of water and C drinks it eagerly.

1) The earliest illocutionary acts are requests for objects, objects close to the child, then objects further away. All this is linked to the development of object permanence. The earliest requests signalled especially by reaching. Initially words are almost always paired with gestures. Gestures become less important, and almost disappear by age 2.
2) Then come requests for interaction, to do things with an adult
3) Then come requests for supportive action, to help the child with a task.

3. Other issues

a. How do children choose what to encode in words and what not to encode? Good question.

b. Politeness strategies are only fully mastered in the teenage years. Adult L2 learners can though learn the forms much quicker and at an earlier stage in language learning.

I. METALINGUISTIC DEVELOPMENT Fletcher 349ff Carroll ch 11

1. Definition.

The ability to think about language as an object. This develops gradually during childhood. The ability benefits from teaching, and from bilingualism which somehow trains the brain to be more flexible. Some have difficulty on this point, even as adults.

2. Early signs

a. '50 words, children select and avoid words, ie they select words with phonemes or syllabic structures that they can produce accurately, and avoid those they cannot yet produce accurately. This implies that young children are to some extent aware of their own phonetic output and how well it matches the target phonemes of the adult world. Children are aware that their words are different to those of adults. Children choose short easy words at the beginning.

b. In an experiment, children of 2 years were read sentences. They had to judge them as 'good' or 'silly' and then correct them. The children accepted 50% unacceptable sentences, but were able to do it. So young children really do have some metalinguistic skills. (See Carroll p294ff). Y2 children can begin to distinguish between good and silly sentences. They can actively recognise good sentences, and actively recognise bad sentences, even if they do not always get it right.
Age 3, Bilingual children begin to distinguish between languages.

c. Spontaneous **self-corrections and repairs** following a failure to communicate.

d. Self-practice sessions. Talk to yourself. All languages. Playing with language. This trying it out and experimenting with language implies some knowledge about language.

3. Comment

a. We often have to study children indirectly - we cannot ask them if something is grammatical or not, and why.

J. DISCOURSE PROCESSES IN CHILDREN: Next week: Wild children, reading 7. = Steinberg ch4

1. **Conversational skills** (Carroll 296ff)
   Discourse is much more than just monologues, or writing prose. One form of discourse is a conversation. True turn taking.

   The basic rule. It appears that age 2-3, children are developing both the ability to respond appropriately to another's topic of conversation (contingent utterances) and the ability to select their own conversational topics (non adjacent utterances) ie start a new topic of their choice. Two year olds have some semantic and syntactic knowledge, but they do not apply it right away in conversations. Rather, they tend to 'fill their slot' by making some kind of comment, which is not necessarily related to the previous utterance. This ability to respond appropriately is not fully developed until Y3.

   By three years, children are adapting their speech to the listener eg another younger child, or an adult.

   "Code switching**"** the term applies to registers, formality levels, and languages/dialects.

2. **Narrative skills**
   Young children often have considerable difficulty in telling a story. They sometimes use pronouns ambiguously eg to several characters, and linkage (eg in terms of sequence, chronology) between sentences is usually weak. CP L2!!

   But, even young children can use cohesive devices to connect successive sentences in their narratives. The number of types of cohesive devices increases with age and MLU. (Mean Length of Utterance - morphemes). The most common device is lexical cohesion eg repeating words. Adults use more referential devices.

K. LANGUAGE IN THE SCHOOL
See Carroll ch 11 p 301ff
NB Steinberg ch 4.

L. READING

NB Students must do their own reading on this question

NB See Carroll and ch 3 of Steinberg. (p93-122).This latter is very good.

See Also Harley 2014 ch8.

1. Pre-reading already acquired skills include:

a. Many comprehension skills eg extracting meaning from a sentence, interpreting the sentence in a given context, drawing inferences, monitoring one's own comprehension. ie general comprehension skills. eg **intonation requires understanding** (in English).

b. Other new skills include:
   1) control of a pencil
   2) moving from left to right or vv
   3) relating printed language shapes to spoken language

c. The early reader has to identify known words which are in an unfamiliar mode(medium). This involves:
   1) eye movements to scan sentences
   2) recognition of letters and words

2. When should reading be taught?

a, Beginning readers have difficulty with phonological awareness tasks, but their performance improves with age. Developing phonological awareness improves reading skills and, as children learn to read, their phonological awareness increases. Phonological awareness plays a driving role in reading development). Training on phonological awareness can lead to an improvement in segmenting and reading skills in general if it is linked to reading). Laing and Hulme (1999) showed that phonological awareness correlates with the ability of young children to learn to associate phonetic cues with words (e.g., "bfr" for "beaver,"). A recent meta-analysis of studies of learning to read demonstrates the importance of phonological awareness in learning to read, and how an impairment in phonological awareness is associated with reading difficulties).

b. In summary, phonological awareness is a central concept in reading, and is absent or impoverished in unskilled readers. The ability to manipulate phonemes and knowledge of letter– sound correspondences are particularly important. Phonological awareness and literacy must be interrelated, because impaired phonological awareness leads to difficulty in reading (see later), but the absence of literacy leads to poor performance on tasks of phonological awareness. However, not all researchers accept that it has yet been conclusively shown that phonological awareness skills precede and play a causal role in learning to read, rather than being just correlated with, or a consequence of, reading development.

   So although it is clear that phonological awareness and reading development are related, there remains controversy as to whether phonological awareness is the cause or consequence of literacy.

c. In summary, in natural situations younger reading-age children tend to read using grapheme– phoneme correspondences, and older reading-age children tend to read by analogy based mainly on rime. They are sensitive to task demands, how- ever, and younger children can be encouraged to read by analogy by the clue word technique.

d. There is evidence that once children know something about reading—once they have acquired the basics of phonological recoding—they in part teach themselves to read (Share, 1995).

e. When should reading be taught? The age at which children start to learn to read seems to be relatively unimportant—indeed, even when it is delayed until age 7 there are no serious or permanent side effects. In fact, older children learn to read more quickly in comparison with younger children. As a corollary of this, very early tuition does not provide any obvious long-term benefits, as late starters catch up so easily.

f. The main question then is how should reading be taught?

g. Finally, mere exposure to print has beneficial effects. Stanovich, West, and Harrison (1995) showed that exposure to print was a significant predictor of vocabulary size and declarative knowledge even after other factors such as working memory differences, educational level, and general skill were taken into account. It is particularly important for adults to involve young children actively with print, rather than children just merely being passively exposed to it. Hence games and activities that get children to manipulate letters and words and involve them in carrying out some early form of reading are highly desirable. Indeed, lack of exposure to print can lead to a developmental delay in reading, and may even be one factor causing developmental surface dyslexia.

3. **Phonological awareness and reading TD.** Ask this!! What is phonological awareness? What is the link to reading?

Definition 1: is a general term describing a person's awareness that spoken words are made up of sounds. These sounds can be rearranged to make other words. This might seem obvious to some children but many of them need to be taught this technique. It is essential for developing reading skills.
www.learningbooks.net/pre-reading-teaching.html

Definition 2. Developing literacy requires an awareness that the spoken language can be taken apart in many different ways: sentences broken into words, words divided into syllables (sis/ter), and syllables divided into smaller, individual sounds (phonemes) such as /c/ /a/ /t/. ...
www.learner.org/workshops/readingk2/front/keyterms2.html

Linking graphemes to phonemes often difficult in English because:

a. frequent lack of correspondence between them

b. some graphemes are pronounced in ways that are difficult to anticipate eg PH in photography, eg silent letters

c. children tend to be weak in metalinguistic awareness of phonemes. They often find it hard to tell you how many different sounds there are in a word, whereas the number of syllables is easier. (p305). Hence the method of teaching syllables, ie how to say each syllable.

d. Not surprisingly, training on metalinguistic skills should lead to reading improvements

4. **Top-down and bottom-up processes**
TD/discussion, meaning of these terms.
In adults, the better readers are the top-down AND bottom up. Each skill is used as needed. Poor readers tend to use only bottom-up strategies. (See Weir etc)
But in children, it seems that better readers rely LESS on top down, on guessing, but have automated the reading, ie the recognition of words.
Better readers can move from: Context >context content > meaning > grammar
They can also link together phonemes and graphemes and recognise words.

There are basically three methods to teach reading

5. The whole-word approach

a. Focus on meaning, and learning to recognise the whole word.

b. Children have huge memories, they can learn thousands of written forms if the right method is used.

c. Fluent adult learners use the whole-word strategy in identifying words, and the emphasis is on prediction of meaning, not the decoding of sound/letter correspondences. Therefore, it is argued, why not begin this way.

d. Choose only words known to the child, and related to the child and their experience.

e. Follow the natural pattern, children learn rules for themselves, by induction (self analysis). eg no one formally teaches the rule for the plural s etc.

f. Introducing sound-letter correspondence works best after at least 50 words have been learned. Children can largely learn this for themselves anyway.

g. A lot of research shows that **meaningful words are easier to learn than sound correspondences of letters. ie it is the meaningfulness that is most important.**

h. Arguably, (Steinberg p110) reading should never be made contingent on writing progress, because reading can be learned much faster than writing. Reading is independent of the skill of writing. Writing can often reinforce reading.

6. The phonics/decoding approach

a. Focus on reading as a process which converts written language into spoken language and then to meaning. The essence of meaning is the ability to decode reading materials into speech. Once speech is obtained, meaning will follow. They thus propose starting with the mastery of a set of letters and sounds which comprise words.

   If children learn the sound value of letters and letter combinations, then they will be able to decode whole words by decoding them from their component phonemes.

b. But,
   1) why can't phonic-decoding skills be taught AFTER the acquisition of a stock of whole words?
   2) phoneme values for graphemes can be learned through the natural self-discovery process of induction.
   3) IL: why not both?
   4) Supporting research evidence is sparse.
   5) The approach wrongly focuses on sounds (which in themselves are meaningless) rather than meaningful concepts. It may be applicable to phonemic languages such as Arabic, but is not justified given the nature of English orthography.
   6) The individual sounds are not the same when in combination, assimilation etc takes place. eg picked pə- i- kə- ə- də, and this is a high skill to be able to put them together.

7. **Use BOTH methods.** Perhaps begin with whole word, teach some phonics, then encourage whole word.

8. Adults

Phonological awareness and literacy are closely related. Illiterate adults (from an agricultural area of south Portugal) performed poorly on phonological awareness tasks, particularly those involving manipulating phonemes (e.g., adding or deleting phonemes to the starts of nonwords). Ex-illiterate adults, who had received some literacy training in adulthood, performed much bet- ter. Speakers of Chinese, who use a non-alphabetic writing system where there is no correspondence between written symbols and individual sounds, seem less aware of individual phonemes. Chinese adult speakers who were literate in both an alphabetic and a non-alphabetic system could readily perform tasks such as deleting or adding consonants in spoken Chinese words; speakers who were literate only in the non-alphabetic system found the deletion and addition tasks extremely difficult). These studies show that phonological awareness works in both ways: literacy in alphabetic scripts can lead to phonological awareness.

M. Spelling

1. Problems with English orthography TD? Discussion? HW? Steinberg is VERY limited here.
(See notes, See History of English, see Steinberg)

a. Roman orthography, based on the Latin language, had fewer phonemes than English.

b. In English:

1) a letter can be assigned to >1 phoneme [1 letter > 1 sound]
2) letter combinations are used to represent sound eg th (digraph)
3) English spelling does not reflect changes in the spoken language. Spelling has changed relatively little in 600 years, though pronunciation has. Initially when English was written down the correspondence was closer.
4) Letters can relate to grammar. use of -ed 5) Letters can relate to semantics, especially to morphemes (smallest meaningful unit)

c. A major principle in English is One morpheme One spelling.

d. In English, the root is always spelled the same eg sign/signal. If these words were spelt phonetically then the link would be lost.

e. Homophones (same sounds, different meanings) are more common in English than (cp won/one, sun/son, would/wood, threw/through) homographs (one spelling, different sounds, different meanings eg bow, read). Eg scene/seen In this pair there are different meanings but the same sounds. Therefore there are different spellings.

f. Writing is designed to be seen, and there is a trend to so spell as to avoid ambiguity.
Conversely: Different morphemes are spelled differently, whether or not the sound is the same.
Spelling concerns: sounds, grammar, and meaning.

g. Note how the tense marker, -ed, though it is pronounced in three different ways, is written the same because it serves to mark the past tense. The spelling in this case can ignore the pronunciation because the rules are clear.

h. Sometimes a letter is used to signal something about another symbol. Eg the so called silent e changes the previous vowel. cp Pete/pet, mat/mate, man/mane. It can also change the preceding consonant eg cag/cage, ic/ice.

i. Recent research has identified another class, the rime. This is the vowel plus the syllable ending, turns out to be reliably and consistently pronounced in English. Not surprisingly, this unit has proved very effective for teaching beginners. (ARAL21:138)
IL: to be fair to the phonetics people, the childrens courses on phonetics I have seen have used this system. THINK: Interesting to check! Interesting research project!!

To put this differently:
Same morpheme, same spelling Different meaning, different spelling

2. Why not change to the phonemic script?

a. Which dialect or accent would you use as standard?

b. You would quickly lose on a common written standard.

c. Cp Chinese, which is highly iconic. Over 1000 varieties share a common written language, which means all of China is united. The symbols are pronounced in different ways, according to the local variety. there are over 8000 symbols. Now, with computerisation, and the desire to type, simplified scripts are developing, but this restricts understanding. The common written standard is lost.

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N. THE CRITICAL AGE ISSUE IN L1 Ref: Steinberg ch4. Read, HW. Discuss later.

1. Discuss, if children do not learn language at an early age, will they ever learn? Can study wild children: those raised by animals, those who survived for years in the wild without aid, and the deaf and dumb.

2. p140. Without exposure to language, children will not acquire it: there is no pre-programmed language. But, exposure can be in one of several forms: speech, signs, writing, touch.

3. Victor progressed more in written language than in speech, implying what? That speech is more affected by age than is intellectual language ability.

4. The evidence is still sparse and mainly suggestive. (tentative conclusions). If there is a critical age, then it is at least 6 or 7, since Helen and Isabelle achieved mastery of language.

   Also, for learning pronunciation cp L2

   Also, minimum 7 years of learning, cp Bilingualism, Swain etc

Note, several variables.

Learn language	never	....	speech
	partially	....	writing
	complete		

Notes from Handbook of Psychology 2003. Vol 6 ch 7

1. First, the advantage of being young is seen only in the level of ultimate language achievement. Older learners actually make more rapid progress than do younger learners during the ?rst year in a new language community—provided that the opportunities are roughly equal (Snow & Hoefnagel-Hohle, 1978).

2. Second, the advantage of younger second-language learners over older second-language learners in ultimately achieving native-like competence does not abruptly end at puberty but continues past age 20 (Birdsong, 1999).

3. Finally, that advantage may not be so much a function of differences between younger and older brains as much as it is a function of differences between the experiences of younger and older arrivals in the new language community. Children attend school in the new language, whereas adults must do work that their limited language skills allow, thus limiting their exposure to the new language. Additionally, older children and adults have stronger first-language skills and are more likely to continue to read material in their first language than are young children.

4. Recovery from aphasia is better at younger ages, and children have made unique contributions to the process of grammatical expansion in NSL. As long as these data hold, it does seem to be the case that maturation affects the way the brain acquires language. However, the strongest sort of critical period hypothesis—that the window of opportunity for language acquisition is shut by a single biological event—is **not** supported.

5. This is not necessarily telling evidence against the claim that language is biologically based.
   a. Puberty is not a single, well-defined biological event.
   b. There is evidence that even in the animal world, biology alone does not determine when biologically prepared learning can occur. In songbirds, for example, access to social interaction, as opposed to mere exposure to mature song, extends the sensitive period for song learning (Nelson, 1997).