

**How Conservative are children at matching  
their internal grammars to their external inputs?**

**Ling 417  
Lecture I Review**

**Joseph Galasso**

We must first recognize that what in fact makes-up a child's external speech input is nothing more than a stream of sounds. These sounds start-off with no inherent linguistic structure *per se*. Whatever structure is eventually assigned to the input must be that which the child herself imposed on the input—hence, a final target grammar is the end result of a child's ability to match an *internal* grammar to an *external* input, allowing the child to come to parse grammatical sentences. Not surprisingly coming from such a statement, there are insurmountable 'Learnability' questions which arise, as there are abound specific questions surrounding the maturational stages of child language development. These are indeed non-trivial problems: (problems such as *the poverty of stimulus argument*, *parameter setting*, *the innateness hypothesis*, *Universal Grammar*, *constraints on identifying grammars*, etc.) Any serious child language theory must take into full consideration the role the child's internal grammar must play in determining the structure of this stream of sound we call 'input'.

The input alone does not suffice to drive the internal grammars children come to generate. An intuitive assumption would be that it is the actual frequency of the input that drives internal grammars—viz., 'the most often heard, therefore, the earlier acquired'. While this assumption is sometimes borne out, more commonly it is not. For instance, a 'frequency-based' hypothesis might state that 'the more common the word, and the more token examples found in the adult speech, the earlier the word is learned'. But on a lexical level, this can't be correct given that the most common words found in the child's input (spoken by adults) are in fact 'closed-class' functional words (determiners, auxiliaries), and yet these words are acquired last (with open-class lexical words, which are less frequent in the adult speech, being acquired first). Also, on a phonological level, while it may be true that children begin to perceive the idiosyncratic nature of their native L1 phonology by the early age of 9 months, (and perhaps begin to lose the ability to contrast non-occurring phonemes by age one), young children nonetheless don't seem to fully perceive the full range of their L1 syllabic structures.

Finally, we must not fail to realize that the input itself breaks down along different processing distinction, and any putative disparity regarding a child's sensitivity to input may likewise fall into these distinct processes. For instance, while a very young child may perceive the phoneme /s/, this doesn't necessarily mean that the verbal third person/singular/present tense {-s} will be perceived equally early-on: one is phonologically perception, while the other is morpho-syntactic. Likewise, for lexical words—while the phrase e.g., '[Ø book] is nice' with a missing determiner may evoke a child's negative response suggesting a marked structure, it doesn't necessarily mean that children will therefore produce determiners early-on in their speech. They do not. It is in fact not clear whether or not children just know that 'some phonological material' must come before a noun, [# + noun], or whether they indeed realize that there must be the 'category determiner' that fills the slot. In short, a child's morpho-phonetic knowledge of a language/grammar may not transfer over to semantic-syntactic knowledge. One very clever example of this is attested in the following experiment. When 16 month-old children are presented with the two sentences \*'The boy play ball' (incorrect non-inflection on the verb 'play-Ø') vs. *The boy play-s ball* (correct verb), they seem to be sensitive to the correct verbal inflection. Experiments bear this out. However, these same children seemingly are unable to transfer such knowledge to observe the verbal {s} usage in the following twin sentences:

- (a) The elephant dress.
- (b) The elephant dresses.

When the same children are asked to match these two sentences to the two pictures presented to them: (a) 'A dress with elephants on it' (= The elephant dress), and (b) 'An elephant who is dressing' (= the elephant dresses), they are unable to match the appropriate picture with the appropriate sentence.

These are just some of the many examples in this lecture we'll be examining in trying to understanding how the child's speech input is partitioned—input rendered either as 'frequency-sensitive' or 'non-frequency-sensitive'.

**Overview:**

**1. Phonology**

**a. + Conservative**

1. IPA Chart: Phonemic perception as early as 9 months of age.
2. Lose of ability to contrast non-L1 sounds by age 1.
3. Phonological Bootstrapping Hypothesis
4. Full phonological awareness (at 18 months) of certain lexical items—e.g., top of ‘U-shape’ learning (potential non-segmental idiomatic sounds).
5. Certain morpho-phonetic elements are conserved as chunks: e.g., [raisins], not [[raisin]s].

**b. –Conservative**

1. Phonemic sensitivity may not translate to morphology—e.g., phoneme /s/ may be salient but the morpheme {-s} is not. Examples, ‘dance’ /dæns/, with pronounced /s/, but ‘Mary play-Ø’ /ple:/ (*Mary plays*) without pronounced /s/.
2. Sally Experiment: morpho-phonetics differences between lexical vs. functional categories.
3. Children may not be able to tap-out individual phonemes within words, though while showing sensitivity to L1 phonology at a phonemic level. => syllabic development.
4. Syllabic development: reduced [CV] for input [CVC] e.g., the word ‘cat’.
5. ‘U-shape learning’ ‘pretty’ => ‘bedi’

**2. Morphology**

**a. + Conservative**

1. Children as young as 15-18 months begin not only to perceived, but also produce a range of open-class lexical categories. Certain morphology may be ‘memorized’ as idiomatic chunks—e.g., [raisins], not [[raisin]s]. (See morphological ‘u-shape’ learning).
2. Derivational morphology e.g., {er} in the word ‘dancer’ seems to be quite conservative and may not be processed as [[danc]er], but [dancer].

**b. –Conservative**

1. Though the input provides at a much higher frequency closed-class functional words (e.g., Determiner ‘the’, Auxiliary ‘is’), as compared to open-class lexical words (e.g., Nouns, Verbs), children nevertheless first acquire lexical categories, and only later acquire functional categories.
2. ‘U-shape learning’ exhibits both the ‘idiomatic’ [+conservative] aspect of word (upper left of the U) as well as the ‘rule-based’ [–conservative] aspect of the word (bottom U).
3. See the ‘Sally Experiment’.
4. See ‘Rat-eater experiment’.

## Lecture I

Much of our class discussion thus far has been built around using the **B.F. Skinner vs. Noam Chomsky debate** as a **pedagogical device**—such that a child would be said to use a ‘Skinnerian’ mode of matching her grammar to input in a direct input-output scheme (i.e.,  $Lx \Rightarrow Lx$ , or language ‘x’ goes in (input) and language ‘x’ goes out). While this is a ‘conservative’ notion of matching grammar to input, and while there are some good examples showing that children may in fact be conservative with their target grammar hypotheses, there are plenty of other well know examples found in the acquisition literature which demonstrate that children are NOT conservative in nature with the task of matching their internal grammars to their external input. In such cases, children seem to form (initially incorrect) hypotheses about their grammars which cannot be traced back to evidence as found in the actual direct input. In this case, a ‘non-conservative’ Chomskyan mode of processing might better address what the child is doing in forming her target hypothesis about her grammar, or  $Lx \Rightarrow Lxyz$ , or Language ‘x’ goes in, but language ‘xyx’ goes out.

Let’s address both cases: (i) how children are conservative (Skinner), and (ii) how children are not conservative (Chomsky). Let’s do this by closely examining how children begin to acquire their early words—i.e., by closely examining their **phonological** and **morphological mapping**.

### 1. Phonology

#### 1.1 How children are conservative: ‘Phonological Bootstrapping’

##### How do children segment words?

There is initial child evidence showing that children are in fact quite conservative with matching their phonological grammars to their inputs. In fact, studies show that infants become sensitive to their native L1 phonology as early as nine months of age, and that infants may begin to lose the ability to contrast and discriminate non-occurring L1 phonemes by the time they are a year old. Of course, one can question ‘What exactly is the nature of this conservatism?’ In Chomskyan terms, such questioning directly speaks to issues of innateness—specifically, that children come equipped with some basic blueprints allowing the child to formulate early and correct hypotheses about their external input. Skinner-based schools-of-thought though would quickly dismiss any such claim for innate language and rather focus on the child’s interface with the environmental input.

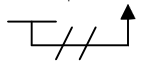
*Phonemic awareness.* Many child language studies have shown that children may begin to be quite sensitive to phonemic development early-on. Studies show that children as young as nine months begin to know what their native L1 phonological system sounds like and what would constitute as an improbable L1 phoneme. In this sense, infants are conservative in matching their inputs to their phonemic template formations extremely early-on in the development. While this conservative matching may exist at the (narrow) phonemic level, there are other studies that show that the same sensitivity may not mature at the same stage regarding the (broad) syllabic template level. One such example is this

disparity is seen via ‘phonemic tapping’ (i.e, the tapping out of phonemes within a given word). For example, while it may very well be the case the infants, by their first year of life, can perceive L1 phonemes on an individual level, these same infants (including children up to two and three years of age) may not be able to tap out the three phonemes for the [CVC] word ‘cat’ /kæt/. It has been shown that infants may first perceive the word ‘cat’ as having only two phonemes, coinciding with the onset /k/ and rime /æt/. This credits the child with only perceiving the sounds at a syllabic level ([C] onset + [VC] rime), and not a phonemic level. So, it seems that these two different processes have different maturational onset times, potentially unrelated to the actual direct input. Recall, a conservative reading of the input would have the child process the word ‘cat’ as [CVC] /kæt/, not [CV] /kæ/.

It is also important to realize that such processing distinction show up with regards to linguistic distinctions. For instance, while an infant may very well be able to perceive the phoneme /s/, this knowledge may not necessarily translate into knowledge about, say, the verbal {-s} or the plural {-s} (e.g., Mary cook-s taco-s). Notwithstanding the fact the the phoneme /s/ may be perceived early-on in an infants life, these same two phonemes, when processed on a morphological level, are acquired later-on in development (as shown by the classic 1973 Brown studies).

*Syllable awareness.* For instance, children seem to innately know, for example, that English words tend not to allow adjacent plosives within a word internally. Given this tacit knowledge, words such as *tiptoe* **and** *hotdog* cannot be processed as an unsegmented single word. If ‘tiptoe’ won’t be segmented as a single word, then the syllable boundary [[CVC]\$[CVC]] kicks-in, allowing the child to discover that indeed the word is a compound structure [[tip]\$[toe]] (\$ marks syllable boundary). This [CVC] structure splitting the compound into two segments would then block the possibility of otherwise potential strings \*[[tipt][oe]] (with /pt/ adjacency within the first syllable) or \*[[ti][ptoe]] (with /pt/ within the final syllable). Again, since adjacent plosives are not allowed within the word, (a matter of phonotactics), children come to realize the compound directly from the CVC structure.

Recall our discussion above regarding the syllable boundary constraint. As compared to the word *cars* /karz/, we noted how assimilation did not cut across the syllable boundary in the word *Carson* /kars^n/ (/CVC-\$-CVC/)

(1) /k a r \$ s ^ n/  


Well, such phonotactic knowledge of constraints might in fact lead a young child as early as 18months into forming the correct hypothesis about where a word ends and where a new word begins. Using similar phonological constraints

on assimilation, consider how phonological **prosody** and/or **stress** might lead the child in gaining access to word formations.

(2) The teacher sits.  
/ ðə # tɪ tʃər # sɪ ts /

Note above the stress diacritics showing a reduced stress value for the functional word *the* (unstressed schwa /ə/) and an initial stress value for the two remaining lexical words *teacher* (stress initial) and *sits* (stress initial). Children seem to take such prosodic stress information and calculate (via tacit processing) where a previous word ends and where a new word begins, as it would be indicated by our word boundary (generated via syllable boundary).

This notion that children utilize phonology (via prosody and stress) to determine word has been termed the **Phonological or Prosodic bootstrapping Hypotheses**. Under these assumptions, a child would not entertain the incorrect hypothesis that the ambient speech input of ‘the teacher sits’ could be segmented as \*‘thet eachers its’:

(3) \* [The-t] [eacher-s] [its]  
/ ðət # i tʃərs # I ts/

This incorrect assumption about these two word boundaries doesn’t enter into the child’s bootstrapping due to two facts:

- (i) The functional word ‘the’ is by definition unstressed. This removes the possibility that a CVC could be extended since there first must be a CV with vowel stress as part of a primary onset/rime structure.
- (ii) This point above then secures for the child that whatever consonant that follows in the speech stream must be part of the next word since CVC (unstressed) has been eliminated from the equation. This in turn ensures that the /t/ of the next word ‘teachers’ correctly remains as the onset of the following word.
- (iii) The ‘s’ could in theory attach to the end of [[teacher]s] (as with plural formations) but then *assimilation* would have to ensure. It doesn’t, forcing the child to assume correctly that the /s/

comes as the onset of the following word, as opposed to it making-up a complex coda of the previous word.

The above examples could be used as evidence that children are in fact conservative about matching their internal grammars to their external inputs, or in a Skinnerian sense, what goes in comes out ( $Lx \Rightarrow Lx$ ).

Evidence of Non-s=conservatism here would amount to phonology errors such as— e.g., ‘\*thet eachers its’ being a possible error found in the production of child speech.

## 1.2 How children are not conservative: ‘U-shape learning’

### Steps to U-shape learning in Phonology

There are however plenty of good data showing that the child may not be so conservative with matching their internal grammars to their external inputs, leading to production errors of omission (wrongly leaving things out) and commissions (wrongly inserting things in). One great example of child-to-adult discontinuity can be found with regarding phonological ‘U-shape learning’.

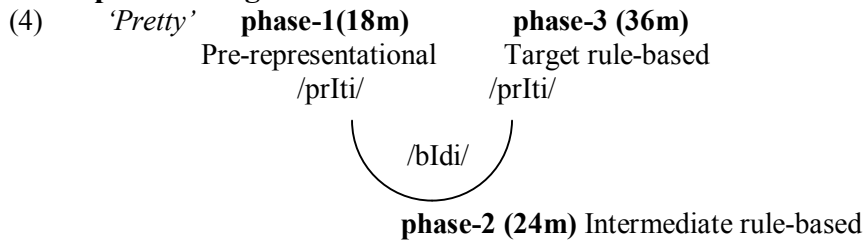
Let’s follow how a target word such as ‘*Pretty*’ might project ‘u-shape’ learning from 18 months through to 36 months (+/-20%):

→ (i) Phase-1 (18m): /prIti/ pristine pronunciation based on idiomatic/memorized speech (no phonology rules, no phonemic awareness, no syllabic distinction) Mimic and idiomatic speech makes-up this (upper-left) stage/part of the U-shape learning curve. (Phonological rules are not yet applied).

→ (ii) Phases-2: (18-24m) /bIdi/ (default voicing of /p/ and /t/, /t/ deletion due to early restrictions based on CVCV template (phonological rules emerge).

→ (iii) Phase-3: (2-3years) /prIti/ target word restored (established CC initial cluster, default voicing removed).

**U-Shape Learning:**



**Stage-2 shows an immature phonological/representational stage:**

- Representational target stage showing phonetic and syllabic representation
- The double consonant CC is reduced to a sole consonant onset C (= CV stage of development)
- The default voicing rule applies assimilating the [-voice] bilabial plosives /p/ to [+voice] /b/ and alveolar /t/ to /d/.

(Note: This same type of child language **U-shape learning** appears with **morphology**—e.g., *went* > to \**goed* > back to *went*).

**Other Evidence of non-matching**

Other strong evidence showing that young children are not conservative with matching their internal grammar to their external input comes to us via child-to-adult discontinuity of syllabic development. For example, early MLU utterances of /CVC/ structures (e.g., *cat* /kæt/) often reduce for children to /CV/ structures e.g., *cat* = /kæ:/. This is not because the children cannot hear from the external input the final voiceless stop /t/, but rather because very young children (say 18 months of age) have not yet established the larger /CVC/ syllabic template (and the final /C/ must drop)—i.e., it is rather a production (based on syllabic development) and not a comprehension shortcoming. Other developmental examples include *banana* /nænæ/ (with initial weak /CV/ deletion, followed by a more prosaic /CV/ germination). The syllabic development in very young children (18 months to 6 years of age) seems to follow the sequence presented below:

**Syllabic Development:**

**Syllabic Phases:**

**Phase-1:** 10-18m      Idiomatic speech (parroting)  
CV: /ba/, /ga/, /kæ:/

**Pre-representational** CV: CV (germination of CV): /baba/,  
/kaka/,

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**Representational**

**Phase-2:** 18-24m      CVC (= proto-word template)  
e.g., /kæ: t/, /kul/ (= *school*)

**Phase-3:** 2-3years      /CVCV /  
e.g., bɪdi/ (as in u-shape learning, ex. 'pretty'),  
/nænæ/ for *banana* whereby the weak initial CV /ba/  
structure is deleted in favor of the stressed CVCV  
structure—this process is called 'weak syllable  
deletion' and again proves that child phonological  
processes are rule-based early on.

**Phase-4:** 4<sup>+</sup> years      (C)CCVCCC(C) /splɪntərz/ (*splinters*)

One very nice finding that has come out of recent fMRI studies has shown that there is indeed a processing distinction to be made, as indicated by activity in certain areas of the brain, which suggests that (i) idiomatic Pre-Representational speech in very young children, prior to 18 months, is in fact not rule-based and triggers only the associative temporal lobe area of the brain, while (ii) true representational speech, as uttered by children beginning in phase-2, triggers frontal lobe activity.

Young children (18-24m) when asked to 'tap-out' the syllable of the word 'cat', /kæt/, may in fact tap out only two taps: /kæ/ and /t/. This would seem to indicate that the young child is not segmenting the true phonemes on a one-to-one level, but rather is tapping out syllable chunks. This would be evidence of non-conservatism. Younger still, children may go through an even earlier prior stage where only one tap would be register for the word 'cat' /kæt/ showing complement formulaic and non-segmented phonemic awareness.

One theory that has come out of such recent fMRI findings is a theory called **Speech is Special**. This theory basically suggests that speech, unlike environmental or idiomatic sound, is processed much in the manner of syntax and is thus computed in Broca's area of the brain. It is also this frontal lobe rule-based processing of speech which calls for a distinction to be made between animal cries, chants (as in animal communication) and human speech (language).

## 2. Morphology

### 2.1 How children are conservative: ‘Syntactic Bootstrapping’

#### How do children map words to syntax?

There is an idea that children are guided by the overall syntax when it comes to their development of word learning. For example, the Syntactic bootstrapping hypothesis suggests that children can obtain clues from the input in a fairly conservative manner, allowing them to map words to syntactic based on how the word is perceived to be serving meaning within the larger syntax. Studies show that made-up nonce words such as ‘gorp’, can come to mean different things to different children based upon how the word is presented within the larger syntax. In other words, the meaning of the word seems to be coming from higher levels of syntax, and not via word-meaning as revealed in isolation. There is no reason to think that this is not conservative learning, since ‘word mapping to meanings’ are largely dependent on context for all target grammars.

In the classic experiments, children were grouped into two. Group #1 was presented with the sentence ‘The rabbit and the duck were gorp’ing’, Group #2 was presented with the sentence ‘The rabbit gorp’ed the duck’. Group #1 perceived and learned the nonce verb ‘gorp’ as meaning an action verb upon which both animals could partake. The general meaning of ‘gorp’ for group #1 equated to mean something like ‘ran together’, ‘played together’, etc. something that both the rabbit and the duck could do together. This verb was not interpreted as a causative verb whereby the meaning of ‘gorp’ would equate to ‘hit’, ‘pull’, ‘chock’—e.g., \* ‘The rabbit and the duck were hitting each other’ was not a possible interpretation for the children. The fact that both the rabbit and the duck were potential subjects rendered the verb’s meaning—hence, higher-level syntax seems to play a role in mapping word to meaning. Group #2 however did react to the verb ‘gorp’ in such a way as to suggest that they interpreted the verb to be causative in nature, to cause an action of one over another, such as ‘hit’, ‘pull’, ‘chock’—e.g. ‘The rabbit gorp’ed (chocked) the duck’ was a possible interpretation for the children in group #1, not group #2 Syntactic bootstrapping in children doesn’t seem to deviate from adult mapping and so continuity between child and adult is preserved.

### 2.2 How children are not conservative: ‘Morphological errors’

#### The ‘Sally Experiment’

Children seem to come innately equipped with being able to partition chunks of words into two fundamental categories: Nouns and Verbs. This may be a universal cognitive mode of human cognitive ability to cut-up the world as we see it—into states of beings (Noun) and their actions (Verb). These two categories are linguistically defined as **lexical categories** and such categories are part and parcel of how we derive meaning out of our communication. The ‘Sally Experiment’ was a device which showed how lexical morphemes and lexical words alike seem to behave in very conservative ways, where lexical items resist omission and commission errors of the sort found amongst **functional** items.

### The ‘Sally Experiment’: Lexical vs. Functional Grammar

One very nice way to illustrate the essential difference found between **Lexical and Functional grammar** is to call upon an experiment referred to here as the ‘Sally Experiment’. The experiment offers us a classic case into how ESL students tend to realize distinct units of grammar (ESL=English as a Second Language or L2). The token ‘Sally’ sentence below illustrates in a very natural way the classic distinction made between what is Lexical vs. Functional, a distinction typically referred to as Substantive vs. Non-substantive units of language. The heart of the experiment relies on the distribution of the /s/ in the two token sentences below: *Sally wears strange socks*.

#### *Sally Experiment.*

(5)

- (a) Sally wear-s strange sock-s. (spoken by native English/L1)
- (b) Sally wear-∅ strange sock-∅ (spoken by non-native ESL/L2)
- (c) Miss Sally like-s to dance once a week.

/s//s/      /s/      /s/      /s/

It should be made obvious in the token sentence pair (one of many presented in the experiment) that the phonological unit (or phoneme) /s/ is what is being examined here. However, when one takes a closer look, there emerges an interesting asymmetry in *what gets left out where* in specific ESL/L2 contexts (ex. 5b). ESL students often delete the functional /s/ when producing natural spontaneous speech, even systematically so. In (5c), note that among all the /s/s, only the functional /s/ affixed to the verb ‘like’ could potentially suffer deletion, notwithstanding the fact that all the /s/ phonemes sound alike. Clearly, this process of omission is not based on phonology, but rather on morphology—namely, the lexical vs. functional distinction. In the specific case above, it appears that although ESL students may pronounce correctly and produce 100% mastery of the underlined phoneme /s/, (as found in the words Sally, strange, socks), they tend to optionally omit (drop) the italic /s/ (the /s/’s found in final position e.g., wear-s, and sock-s, like-s).

This observation forces early-on in our discussion of grammar a further distinction between (i) Phonology, on the one hand, and (ii) Morphology, on the other. For example, if all underlined /s/’s are produced 100% of the time, surely, as expressed above, there is no phonological

deficit. The optional omission of final /s/'s however must rather be attributed to an exclusive deficit in some area of morphology (Also, the final /s/ deletion is not said to be positional in nature since ESL students have no difficulty with other final /s/ words, such as in *dance*, *class*—viz., ESL students would not optionally produce *dan* /dæn/, *cla klæ*/ etc.). Hence, via this experiment, the two aspects of grammar are addressed simultaneously—*Phonology vs. Morphology* and *Lexical vs. Functional*.

These two very distinct aspects of language—and, as it turns out, two types of language processing in the brain—introduce us to a very important and seemingly transcendent dichotomy in language, viz., *Lexical vs. Functional Categorical Grammar* (as illustrated below).

### **Structure vs. Form Class: ‘How do you do?’**

In addition to the Lexical vs. Functional category distinction at the morphological-inflection level, the same distinction holds at the word level: the distinction is labeled (i) **Form Class word** vs. (ii) **Structure Class word**. One way of observing this lexical vs. functional distinction at the word-level is by considering the token interrogative sentence *How do you do?* where the obvious double usage of the word *do* should stand out. In fact, in some of my years of teaching abroad, I have even had the question posed to me in the following manner—‘What does the second *do* mean and why do we have to repeat it so?’ The question stands to an extent only insofar as it depends on the following misunderstanding—namely, ‘if the two words have identical meaning, then how come the repetitive nature of the phrase?’ As we shall see later on in this text, the two *do*'s are indeed not one in the same (notwithstanding the perceived identical pronunciations). Herein lies the confusion: The first *do* is actually functional, containing no meaning whatsoever and only serves some abstract functional purpose—here, it specifically serves to form the grammar of a question (interrogative) sentence. It is only the second *do* which is lexical and thus contains very general generic verb meaning (as in the verbs *go* or *feel* in the greetings *How's it going?* *How do you feel?* etc.).

(Note: Regarding child language acquisition and the types of errors children make, it is interesting to note here that while the lexical main verb ‘do’ often over-regularizes in past tense to ‘doed’ (Me *doed* car, (=I did the car)) such auxiliary verb over-regularization is mostly unattested in the child language data (@ marks an utterance type unattested in the data)—e.g., structures such as @*Doed* you see that? and @What *doed* you see? are very rarely produced if ever by children).

One simple way to uncover this distinction between lexical *do* and functional *do* is to evoke the **substitution test**—a beloved test of linguists which often helps to get a better handle on the nature and distribution of a particular class or category of words. Consider the substitution test below in (6) where we can see the selective distribution between (i) the first **Functional Auxiliary-Verb** *do* (Verb1) and (ii) the second **Lexical Main-Verb** *do* (Verb2):

(6) Table: The Substitution Test

Wh-Q + Verb 1 + Subject	Verb 2
a. How do you	do?
b. do	know?
c. do	speak?
d. do	feel?
e. do	cook?
*f. How know you	do?
*g. How speak you	do ?
*h. How feel you	do ?
*i. How do you	∅ ?
%j. How ∅ you	do ?

(\* marks ungrammatical sentence, % marks acceptable in reduced speech, ex. j)

Surely, *\*How speak you do?* (6g) is an improper, ungrammatical interrogative sentence. This distinction goes to the heart of the issue as discussed above. By misplacing the verbs into the opposing slots, we shatter the syntax and thus the overall meaning of the sentence. More specifically, the lexical *do* (which is positioned in the Verb-2 slot) is the main verb and carries the substantive meaning of the verb *to do*, whereas the functional *do* (Verb-1)—sometimes referred to as the *Dummy-‘do’ insert*—is merely an Auxiliary verb (void of any verbal meaning) and is inserted between the Wh-word and the Subject in the capacity of an abstract interrogative marker. This is precisely why sentences (6f-i) are ungrammatical—namely, where we ought to have a substantive main verb carrying out its full verbal meaning in the appropriate slot, we have instead a ‘Dummy-do’ auxiliary verb void of any potential meaning. Returning then to the original question which spawned the above substitution test, we now see that indeed the two seemingly identical *do*’s are not alike: whereas they may be alike on a phonological level /du: /, they are two very different items at the morpho-syntactic/grammatical level. (Note that in fast pronunciation, the first Aux *do* gets reduced and deleted to /hau-yə -du/ (IPA) (=How ø you do?). Conversely, just try to omit the lexical ‘do’—e.g., *How do you ø?* As you quickly see, no meaning can be attributed to this utterance since there is no overt lexical main verb.)

### 3. Final examples of Non-conservative grammars

#### 3.1 Over-regularizations: morphology

- (7) Break-ed (= broke), draw-ed (= drew), sleep-ed (= slept), go-ed (= went),  
Went-ed (= went), tooth-s (= teeth), etc. etc.

Such examples of commission errors suggest that child grammars are not entirely conservative in nature, of the type Lx (goes in) => Lxyz (goes out) (Chomsky).

#### 3.2 Copying of moved elements: syntax

- (8) What do you think *what* pigs eat? (copy of moved item 'what')  
(9) Why could snoopy *couldn't* fit in the boat? (copy of 'could').

#### 3.3 Double Tense

- (10) What did you saw?  
(11) Why did you broke it?

#### 3.4 Wrong accusative case on subjects and possessives

- (12) Me do it (=I do it) (wrong accusative case on subject)  
(13) Him me friend (= He is my friend) (wrong accusative case for possessive).

#### 3.5 The 'Rat-eater' experiment

The experiment shows that certain elements as found in the input (e.g., the plural {s}) must delete when compounding is called upon. Compounding requires the merging of a [lexical item 'x'] + [lexical item 'y'] in forming a new larger lexical item ['xy'] –e.g., [[black] [bird]] = [blackbird]. Similarly, when young children were asked to respond to the question: **What do you call a person who eats rats?** The children responded 'rat-eater' [rat]+[eater] whereby they automatically dropped the intervening plural {s}. The theoretically possible compound \*Rat-s-eater' is never produced by children. It seems children do not conserve the plural {s} here even though it is found in the input. On the other hand, when the children were asked to perform the same compound based on the question: **What do you call a person who eats mice?**, the compound [mice-eater] was produced, indeed maintaining the plural marker since this marker is irregular in nature and the word is memorized as a chunk, hence +conservative. (\*Not that the rule-based [N+{s} = plural] is treated differently from the irregular plural formation).

**4. Lecture I main topics in order of class presentation**

1. Skinner vs. Chomsky
2. The Biological Basis of Language
3. IPA charts: place & manner of articulation
4. Ex. Minimal pairs
5. Phonological Rules, Phonotactics, Assimilation and Constraints on Assimilation.
6. L1 phonological interference (ESL perspectives)
7. The Native Language Magnet Theory: phonemic perception
8. Phonological Development: phonemic, syllabic development
9. Lexical Development: Word
10. Lexical vs. Functional categories
11. Derivational vs. Inflectional morphology
12. Morphological processes and Word Mapping