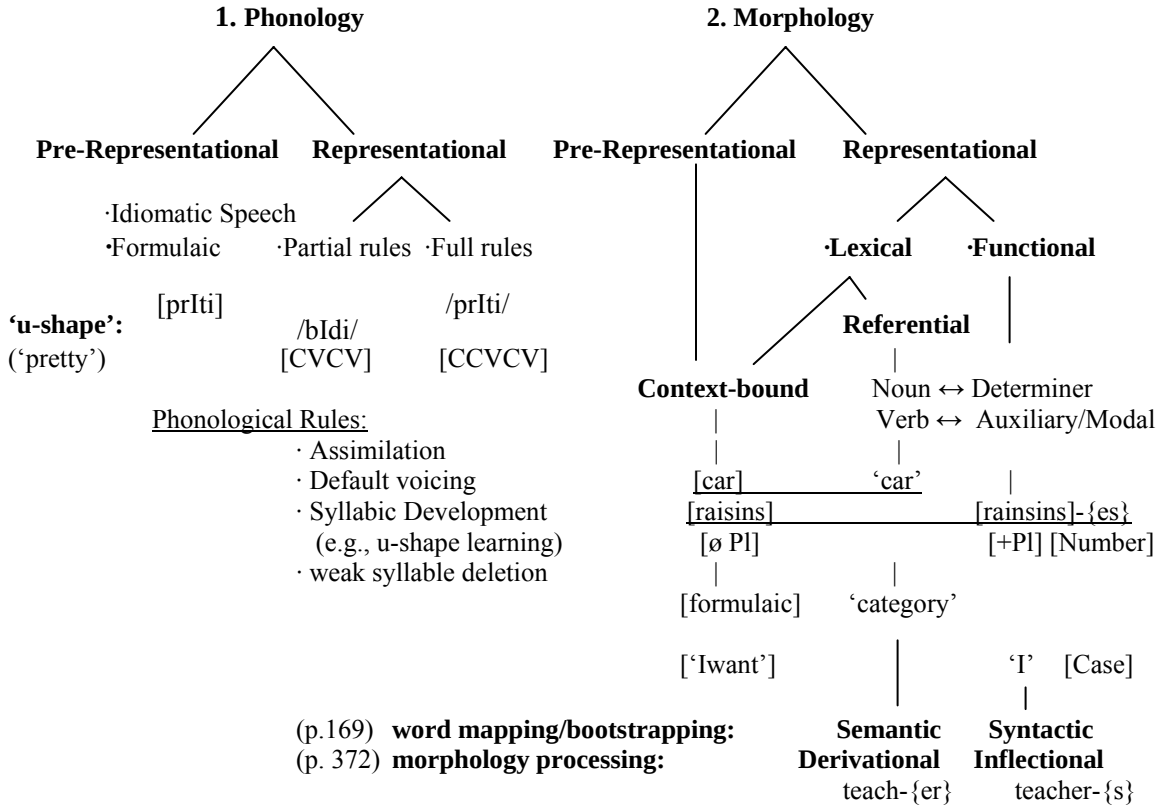
A Synthesis:
Representational Stages in Child Phonological and Morphological Development

Lecture Review (Chapters 3-4)
Galasso

Stages of 'Rule Representation' Scheme:



Data: (Galasso) 'Sally Exp'
(Gordon) 'Rat-eater Exp.
fMRI Brain Imagining

Overview: Children first produce language in a pre-representational way whereby both Phonology and Morphology are underdeveloped. Regarding phonology, idiomatic speech such as *formulaic, echolalia and mimic* expressions are the hallmark of a Pre-Representational stage, usually beginning as early as 14 months and lasting up until 24months (+/-20%). Regarding Morphology, chunking has been observed whereby young children (up until 24months) are seemingly unable to partition the morphological segments e.g., [stem+affix] and rather produce both as a single whole chunk—e.g., 'raisins' (as a singular word and where the plural {s}is not yet productive).

1. Phonology: Phonemic/Syllabic Development and Consonant Harmony

[1] The early production of the word 'spaghetti' offers linguists a valuable insight into the **phonological rules** children employ at the earliest stages of **representational speech**.

(p. 93) (a) spaghetti → /bʌzgɛdi/

Above, *spaghetti* /spʌgɛti/ becomes /bʌzgɛdi/ (CVC+CVCv) with initial /s/ deletion and strategic reinsertion (voiced to /z/) to create the /CVC-CVCv/ structure. Otherwise, (i) if the initial /s/ stays in place, the child is confronted with a /CC/ double consonant onset which might not be available at the given **syllabic stage of development**), (ii) if the /s/ gets deleted, never again to insert as /z/ for final /C/ of the initial /CVC/ structure, the child then confronts a CVC-*VCV /bʌgɛdi/ thus losing the preferred CVC proto-word template. (/p/, /t/ become voiced /b/, /d/ by **default voicing**).

[2] This rule-based representation is similar to what we found regarding **U-shape** learning of phonology: **Phonological U-shape** learning (cited from Hildegard, Leopold 1939-1949)

Stage-1
• Pre-representational stage: (MLUw ≥2.2)
/prIti/

Stage-3
• Target grammar (MLUw 2.8)
/prIti/

/bIdi/
Stage-2
• Representational stage showing phonetic and syllabic representation (MLUw ≤2.5)

-- Double consonant CC reduced to a sole consonant onset C (= CV stage of development)
-- Default voicing assimilating the [-voice] bilabial plosives /p/ to [+voice] /b/ and alveolar /t/ to /d/.

[3]. There is a child language acquisition stage during which children will engage in **assimilation** seemingly across vowel/consonant phoneme boundaries in an attempt to auto-segment consonants with consonants or vowels with vowels. Consider some well known examples below:

(p. 123) (a) duck /dʌk/ → guk /gʌk/. (velarization)
[CVC] [CVC]

(b) Because /bikʌz/ → /pikʌ/ : /b/ to /p/ (due to assimilation from /k/).
[CVCVC] [CVCV]

[4] Observed above, *autosegmental* assimilation (or consonant harmony/velarization) is found whereby the final consonant [+velar, +voiced/fricative] /k/ is affecting the initial consonant [+alveolar, +voiced/fricative] /d/ and making it +velar. (Hence, if you take /d/ and change its place of articulation from +Alveolar to +Velar—keeping all other distinctive features untouched—the resulting phonemic change is /d/ to /g/). It is this kind of evidence that led some linguists to suppose that early children may not segment on a *phoneme by phoneme level*, but rather may segment and process sound input based on a *syllable by syllable level* or [CV] to [CV].

(p. 369) **Phonemic Awareness**

[5]. For instance, if this is indeed the case, a very young child, say at 2 years of age, may not hear and segment *cat* /kæ: t/ as three different segmental phonemes /k/, /æ: / and /t/, but rather may process /k/ as an initial onset and /æ: t/ as a single [vowel&consonant] coda. By segmenting at a larger syllabic level, as opposed to a finer grained phonemic level, this type of autosegmental assimilation may in fact be adult-like in that there indeed are only two perceived adjacent sounds found in the assimilation process—viz., the initial Consonant and Coda [/C/, /VC/]. (If this is the case, we don't have to add an additional stipulation that the child crosses over the otherwise segmented vowel boundary during assimilation).

(p. 123) (a) Cat [CVC] → /kæ:/ [CV] (due to syllabic development)

(b) because [CVCVC] → /pikʌ/ [C̲VC̲V] (due to voiceless assimilation /k̲/, /p̲/) turning initial voiced /b/ to voiceless /p/ due to adjacent voiceless /k/.

[6] In [5] (a) above, the final [C] /t/ is deleted due to an immature syllabic developmental stage:

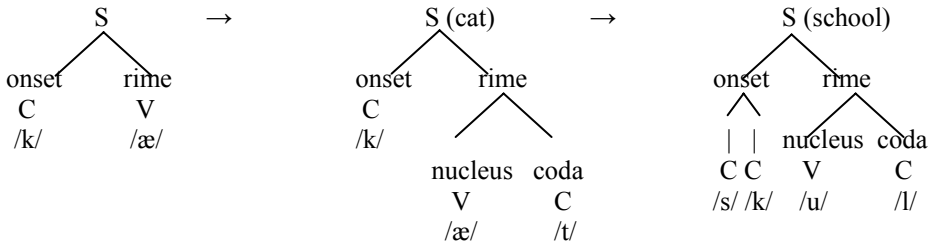
Stages of Syllabic Development

(0-18m) Pre-Representational/Pre-Linguistic

(i) [CV]	(e.g., ba)	
(ii) [CV_i:CV_i]	(e.g., baba)	=> gemination/duplication of [CV: CV]

(24m+) Representational/Linguistic

(iii) [CVC]	(e.g. cat)	=> syllabic/proto-word template
(iv) [CV_iCV_j]	(e.g., kitty)	
(v) [CCVC]…	(e.g., school)	=> consonant cluster



[7] Although three allomorphic phone options are available in presenting the past tense inflection {-ed}—

(i) /d/ as in the word (ple:d/ (*played*),

(ii) /t/ as in the word /kIkt/ (*kicked*) (showing phonological assimilation), and

(iii) /Id/ otherwise as the default--children start with the /Id/ default form and maintain it up until a certain age of development. Examples of this range from */kIkId/ (*kicked*), */brokId/ (*broke*), */kɛpId/ (*kept*), */si:Id/ (*saw*), */kʊkId/ (*cooked*), etc.

In other words, once children start to employ the phonological rules associated with the past tense {ed}, they over- regularize the /Id/ pronunciation for {ed}.

[8] *banana* => /nænæ/ is a beautiful example of how such speech could not be based on a memory bottle-neck of sorts (once attributed to such simplified pronunciation). Here, it is the initial unstressed CV structure that has been deleted. Any attempt to suggest that a lack of memory is behind such errors would undoubtedly run into trouble with this example. => weak syllable deletion

2. Morphological Development

(p. 154) [9] Examples of **Pre-Representational** word category can be found in such usages as early productions of *Iwant* where there is seemingly no morpho-phonological segmentation of 'I+want'. The child seems to be processing this as a chunk [['Iwant'] + object].

[10] It was initially reported that the early onset of plural {s} as in the word raisins or ducks (p.) were instances of formulaic speech without morphological segmentation of [stem + affix]. Evidence that this is the case comes from work such as (Berko) which show over-regularization of morphology—e.g., 'raisines', 'wented', or /kʊktId/ (= [cooked]+{ed}), /fIkstId/ (=fixed+{ed}).

(p. 141) [11] **Context-bound** words provide evidence that very young children may not initially classify words into 'categories' at all but rather may solely rely on specific semantic associations attributed to particular contexts.

[12] Distinctions in **Derivational vs. Inflectional Morphology** were reported as seen via our 'Sally Exp. (Galasso) and 'Rat-eater' Exp. (Gordon) (below):

> Words such as 'Paint-s-er', 'Rat-s-eater' are unattested in the data. Children seem to have innate knowledge of [Stem+Derivation+Inflection] ordering. In compounding, only a given stem+stem can bind together, hence *Rat-s-eater is never produced. Only [Lexical+Lexical/Derivational] compounding gets spelled-out with no other Functional/Inflectional intervening affix inserting between stems. In the Gordon Exp. we noted that 'mice-eater' did adhere to our stem+stem/derivational rule since 'mice' is an irregular plural which functions as a whole/stem and where eater is a lexical product of derivational morphology.

(p.173) [13] Word Mapping ('Tadpole-frog' problem): **Semantic bootstrapping** is when children use 'word meaning' to later build-up syntactic categorical classes. **Syntactic bootstrapping** is when children used *a priori* knowledge of syntax to discern word meaning.

Chapter Readings Overview:

Ch. 1-2 Introduction: (Sally Experiment, Berko, Brain Processing (Broca/Wernicke's area as correlated to specific language tasks), Brain development, Human language as opposed to animal communication.

Ch. 3 Phonology: IPA charts (minimal pairs), Phonological rules (assimilation). Phonological Categorical Perception (handout and experiment), Speech development.

Ch. 4 (Ch. 9) Morphology. Lexical vs. Functional word class and Development, Word mapping (semantic vs. syntactic bootstrapping), Derivational vs. Inflectional morphology.

Lecture Notes.