**MOODLE**

**NOTES and Qs, class 7, Sounds and phonemes SEDIVY, ch. 4, part II**

**1. WHAT IS a HUMAN LANGUAGE SOUND?**

Evolutionary adaptation of our biology and anatomy for language sounds

**Linguo-centric cognitive bias implies** universal characteristics of language sounds

2**. IS the PRODUCTION of language SOUNDS INSTINCTIVE? How are language sounds controlled cognitively? The neural control implies…**

voluntary production and suppression;

  managing MULTIPLE STRANDS of physical sound stimuli

hearing language sounds as gradual and continuous rather than as discrete;

ignoring “meaningless” differences;

perceptually boosting some sound distinctions and minimizing others according to the cognitive structure of sounds of the given language:

ADULTs perceive not just by hearing but filtering by the structure the mature mind imposes on speech sounds.

**3. What are the functions assumed by language sounds / how does our mind deal with sounds in relation to what function they have?**

**BRAIN handles language sounds by articulating, perceiving, planning, interpreting et al.**

*STRATEGIES and OUTCOMES (Acquisition, part I):*

* *from world citizens (hearing it all) to local speakers growing accustomed…*
* *parsing and filtering the language input*
* *memory-storing frequent sounds, their prototypes, syllables and sound clusters*
* *thus, learning = parsing, filtering and memorizing rather than mimicking*
* *learning causes cortex-mapping and neural commitment > the mother language: How languages carve up the phonetic space depends on „preferences“ of the given language that speakers acquire and that map their cortex;*
* *„initial language-learning“ is a stage characterized by its learning strategies*
* *initial learning interferes with future learning*
* *learning implies storing efficiently*
* *learning proceeds along with memory-improving*
* *initial learning is followed by rule-learning*
* *initial sound-learning is followed by gaining the naming insight/ understanding concepts and growing vocabulary*
* *initial learning is followed by gradual gaining of sophisticated articulation*

***Sound distinctions and*** ***natural perceptual biases***

*universals of sound physics and perception - some sound distinctions are more “privileged” than others at the start of the baby’s life -* ***natural perceptual biases*** *due to sound physics and perception e.g. voiced vs. v-less Cs*

* *suprasegmentals of tone, stress, pitch and intonation may be used linguistically in shaping word meanings*
* *cognition guides infants in doing statistics*
* *becoming familiar with transitional probability and phonotactic constraints*
* *head-turning experiments with 4-to-18-month-old babies seek to find out …*

*what makes infants pay attention in the flow of language and*

*how they use those moments of attention to learn word boundaries*

* *babies encounter single words out of context only 10% of the time but use them as anchors if the anchors appear regularly (“Is this a recurring word? If yes, I better pay attention“, the baby's mind wonders)*
* *once the anchor words are established, the babies can shift attention to what precedes and follows them, i.e. the word boundaries, and thus recognize words acoustically*
* *becoming familiar with transitional probability and phonotactic constraints leads the mind to generalize, store patterns and extract rules*
* *babies adapt their hearing within 6-12 months to their mother language and reorganize their sound perception while sorting out phonemes*
* *e.g. English develops a bias for consonant voicing vs. Mandarin*
* *English develops a bias for R / L vs. Korean*

**4. WHAT ARE THE MECHANISMS OF SOUND PRODUCTION?**

           Vocal tract and lowering of the larynx – its double function

Hyoid bone support of the tongue

            Mechanisms of fine-tuned sound articulation

            COARTICULATION rather than discrete sounds

            “Smart design”: Efficiency of sound production and perception

**5. ALLOPHONE distribution** across languages

**complementary distribution** within a language is driven by rules of adjusting sounds in the flow of speech

an example of a pattern is using the plural suffix spelled S but pronounced S, Z or IZ, depending on the consonant preceding the sufix: *trucks, beds* and *watches*

plain vs. nasalized vowels and consonants

palatalization of consonants

consonant cluster simplification - e.g. *hands* gets to sound like *hens*

**6. Categorical perception of sounds:** Phonemes vs. allophones

the efficient way of hearing sounds within a language;

the linguistic aspect of perception (pairing with meanings) vs. motor-sensory aspect

**PHONEME**

Infants learn to **perceive sounds “categorically”:**

Experiment: Why do they get bored hearing the B-sound (or any other) over and over, as shown in the less intensive pacifier-sucking with repetitions of B?

* infants don’t deal with the task of considering every possible sound difference as potentially meaningful but focus on the PHONEME that they, as if, hear over and over and “ignore” its variation

> the variation is predictable and rule-driven (i.e., nasalization of vowels, devoicing of word-final consonants, non-releasing word-final stops, palatalization etc.)

> variable pronunciations of sounds depend on one's social and geographical dialect;

**Phoneme** is an abstract generalization over its actual pronunciations that differ depending on the sound environment

= “dramatic learning” and “perceptual reorganization” over the 1st year of life (prior to mapping SOUND CLUSTERS onto MEANINGS in learning words)

PROBLEMS

1. Do babies spot the difference btw *night rate* and *nitrate*? Or *The truck cleare****d ice*** and *throw* ***dice***? What is the **word boundary** difference? (VOT = **time between** releasing C stop and the onset of its voicing)

2. What are the possible allophonic realizations of final consonants across languages? Do they turn out to be voiced or voiceless, or “released” or unreleased in the actual pronunciation? What **natural class** of consonant sounds is affected?

3. How are vowels adjusted when followed by nasal consonants? What are the crosslinguistic differences?

4. What are some other rules driving sound variation in the language you know?

5. Is aspiration in English determined phonetically or phonemically? What natural class of sounds does it affect?

6. Why do speakers have “accent” and how can it be explained? Are you aware of having an accent when speaking another than mother language?

7. How does the language you’ve learned affect your mental organization of speech sounds?

8. How do we know that babies gradually learn which sound distinctions are used to signal differences in meaning in their language?

**GAINING the NAMING INSIGHT and MUTUAL EXCLUSIVITY bias**

Sounds deliver meaning only when patterned into words, suffixes, etc., they don't mean anything when they stand alone!

the vowels in *pin pan pen*change word meanings but are meaningless when they stand alone;

babies memorize stable but meaningless sound clusters but don’t pair them with meaning until they get the „naming insight“

the sound clusters are fuzzy **holistic impressions** of sounds that become **containers for meaning**

14-mo olds confuse sounds if hearing them in unfamiliar/rare words

e.g. *líf – neem* vs. *bih – dih* where they **hear** but **ignore** the difference

* Babies’ representations of meaningful words don’t contain all the phonetic detail at first – they don’t commit all that to long-term memory from which word-meanings are retrieved;
* Babies’ “lexical representations” depend on how mature is their memory, built gradually along with “improved” “lexical representation”: children are learning that “small” differences do count in differentiating meanings (*bad* vs. *dad*).

Matching words to meaning is difficult: experiment w 17-mo-olds – p. 150

Familiarization phase – listening to artificial l.

Phase 2 – learning new words when paired with pictures but only if previously encountered in the stream of artificial l.

According to what cues do babies form conceptual categories?

And according to what cues do babies form grammatical categories?

MUTUAL EXCLUSIVITY bias and getting the “naming insight” p. 165

2 pictures & 2 words: the babe’s thinking: since I know that the one object is a hammer, the other must go by the other word that I don’t know yet

vs. adults don’t just respond to the knowledge of words based on associations but to one’s expectation abt what the other speaker is likely saying:

the hammer can go by all sorts of names but since the most natural name for it was used it must apply to the hammer-O and not to the other O – adults base understanding on expectations that babies don’t have yet