**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?**

by their voluntary production and suppression

  by managing MULTIPLE STRANDS of physical sound stimuli

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

by ignoring meaningless differences;

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

**3. In what functions do we use language sounds and how does mind deal with sounds in relation to their function?**

**BRAIN handles language sounds through the “systems” of producing, perceiving, planning, articulating, 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*
* *storing frequent sounds, their prototypes, syllables and sound clusters in memory*
* *thus, learning = parsing, filtering and memorizing rather than mimicking*
* *learning causes cortex-mapping and neural commitment > the mother language*
* *„initial language-learning“ is a stage characterized by its learning strategies*
* *initial learning interferes with future learning*
* *learning implies selective efficient storing*
* *learning proceeds along with memory-improving*
* *initial learning is followed by rule-learning*
* *initial learning is followed by gaining the naming insight/understanding concepts and growing the vocabulary*
* *initial learning is followed by gaining the capacity of 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, e.g. voiced vs. v-less Cs:*

* *suprasegmentals of tone, stress, pitch and intonation may shape 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:*

*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 they recur*
* *once established, the anchor words guide babies‘ attention to what precedes and follows the anchors > word boundaries and word recognition*
* *transitional probability and phonotactic constraints guide the mind to store patterns, generalize and extract rules*
* *babies adapt their hearing within 6-12 months to their mother language and reorganize their sound perception while sorting out phonemes*
* *English develops a bias for consonant voicing vs. Mandarin*
* *English develops a bias for R vs. 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 articulation

            COARTICULATION

            “Smart design”: Efficient 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

e.g. the plural suffix S is pronounced S, Z or IZ, depending on the preceding consonant > *trucks, beds,* *watches*

e.g. simplifying consonant clusters - e.g. *hands* gets to sound like *hens*

plain vs. nasalized vowels and consonants

palatalization of consonants

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

PHONEME is an abstraction of actual pronunciations affected by sound environment;

is the efficient way of hearing sounds, different from motor-sensory hearing.

Experiment: Infants get bored hearing the B-sound over (less intensive pacifier-sucking)

* infants don’t remember all the possible sound variations but focus on PHONEME that they, as if, hear over and over

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

> sounds vary depending on one's social and geographical dialect;

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

**7. AT WHAT POINT DO SOUNDS BECOME MEANINGFUL?**

What makes sounds distinct from one another? What sounds “contrast” (i.e., replacement of a sound by a sound similar in how and where the sound is articulated shifts word meaning, as in Engl. fit and feet, or Cz ti and ty)?

**categorical perception of sounds: Phonemes vs. allophones**

ADULT speech perception: not just a response to sounds on the physical level but how and what we hear has to do with the structure our mind imposes on speech sounds:

We don’t hear sounds as coming in discrete but gradual and continuous;

we ignore meaningless differences;

the mental structure perceptually boosts some sound distinctions and minimizes others.

This mental structure, having built during language acquisition, perceptually boosts some sound distinctions and minimizes others.

PROBLEM:

What is the **word boundary** difference - do babies spot the difference btw *night rate* and *nitrate*? Or *The truck cleare****d ice*** and *throw* ***dice***?

VOT = **time between** releasing C stop and the onset of voicing the C stop, or…

**ASSIMILATION:**

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

2. Are vowels adjusted when followed by nasal consonants? Crosslinguistic differences?

3. What rules drive sound assimilation in the language you know?

4. Is aspiration in English determined phonetically or phonemically? What natural class of sounds aspirate?

5. What explains accents? Do you have an accent when speaking another language?

6. Does your additional language affect your mental organization of speech sounds?

7. How do we know that babies grasp sound distinctions used to signal meaning differences?

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*).

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

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