Phonological forms: from ferrets to fingers
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Background

Hauser, Chomsky, & Fitch (HCF) [1]:
• Faculty of Language - Broad Sense (FLB): abilities underlying language
• Faculty of Language - Narrow Sense (FLN): the part of FLB which is unique to humans and to language.
• Hypothesis: FLN is small, perhaps Merge & mappings to the interfaces.

How much of phonology is part of FLN?
Pinker & Jackendoff [2] against HCF: “Major characteristics of phonology are specific to language (or to language & music), uniquely human, diverse, & non-recursive. Thus phonology represents a major cornerstone to the recursion-only hypothesis.”

My answer: few, if any, components of phonology are part of FLN. [3,4,6]

Perception, production, phonology

Perception
• Categorical perception / perceptual magnet effect [1]
• Accurate production implying mimicry [1]
• Grouping by natural classes [5]
• Discriminating the sound patterns of language [1]

Production
• Vocal imitation and innovation [1]
• Neurophysiology of action-perception systems [1]
• Constraints imposed by vocal tract anatomy [1]

Patterns & rule learning
• Learning arbitrary patterns of distribution [5]
• Learning / producing rule-governed alternations [5]
• Computation of identity (total, partial, adjacent, non-adjacent) [5]
• Preference for contrast & rhythmicity [3,4]
• Grouping sounds into larger units (e.g. syllables, phrases) [5]
• Statistical distributions through transitional probabilities [5]
• Substitution & ratio comparison (to calculate length & stress) [3]
• Computational operations: search, copy, concatenate, delete [3,4]

Where do features come from?
• Innate (UG) feature system often contrasted with ‘emergent’ features
• Do features define categories or are they abstracted from categories?
• Why are so many features used by so few languages? [7]
• Why do phonetic correlates + cues differ from language to language?
• How does sign language fit into this picture?
• Organization and number of features highly distinct from speech [8,9]
• Features appear learnable from non-linguistic facts about articulators [8]

What can animal perception tell us about phonological representations?
• Tamarins can compute dependencies over vowels and syllables [10]
• Birds & primates (among others) spontaneously attend to formants [14]
• Language exploits evolutionarily old mammalian auditory system
• Category-first vs. feature-first model may be too binary

Where does phonology come from?
• Innate vs. emergent, feature-first vs. category-first not truly opposed
• Phonology may not be strictly necessary, but still inevitable

Phonetics + culture = phonology

• Similar models applicable to vowel systems and birdsong [20]
• Finch isolate song approximates wildtype within a few generations [19]
• Cultural transmission increases systematicity at the cost of iconicity [15]
• Frequent development of phonetic tendencies + phonological rules [21,3]
• Development of morphology seems concurrent with phonology

Conclusions

• Studying animal cognition can shed light on biolinguistic questions
• Phonology does not provide evidence for a large FLN
• Innate vs. emergent, feature-first vs. category-first not truly opposed
• Phonology may not be strictly necessary, but still inevitable

References


Studies of animal cognition suggest at least widespread [3,4,6]