PHONOLOGICAL DEVELOPMENT

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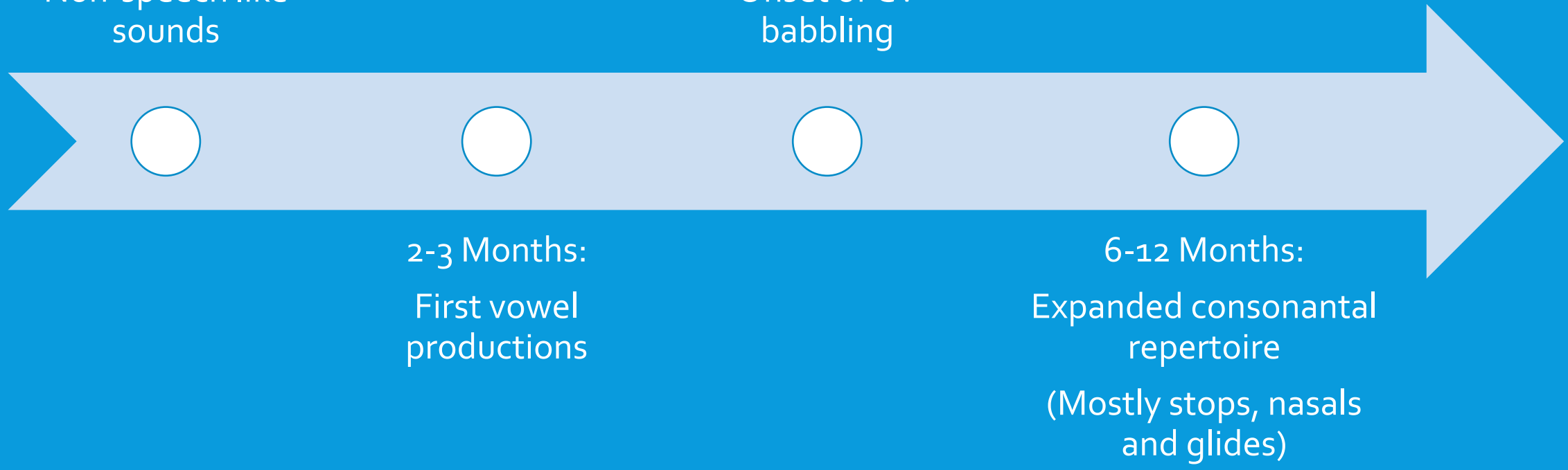
INTRODUCTION

- Phonological acquisition depends on two components:
  - Cognitive-linguistic component
    - Learning the phonological system
  - Development of speech-motor skills

- Both components will be addressed in terms of:
  - Phonological development in children
  - Relationship between phonological and lexical acquisition
  - Theoretical approaches aiming to describe phonology of children

TYPICAL PHONOLOGICAL DEVELOPMENT

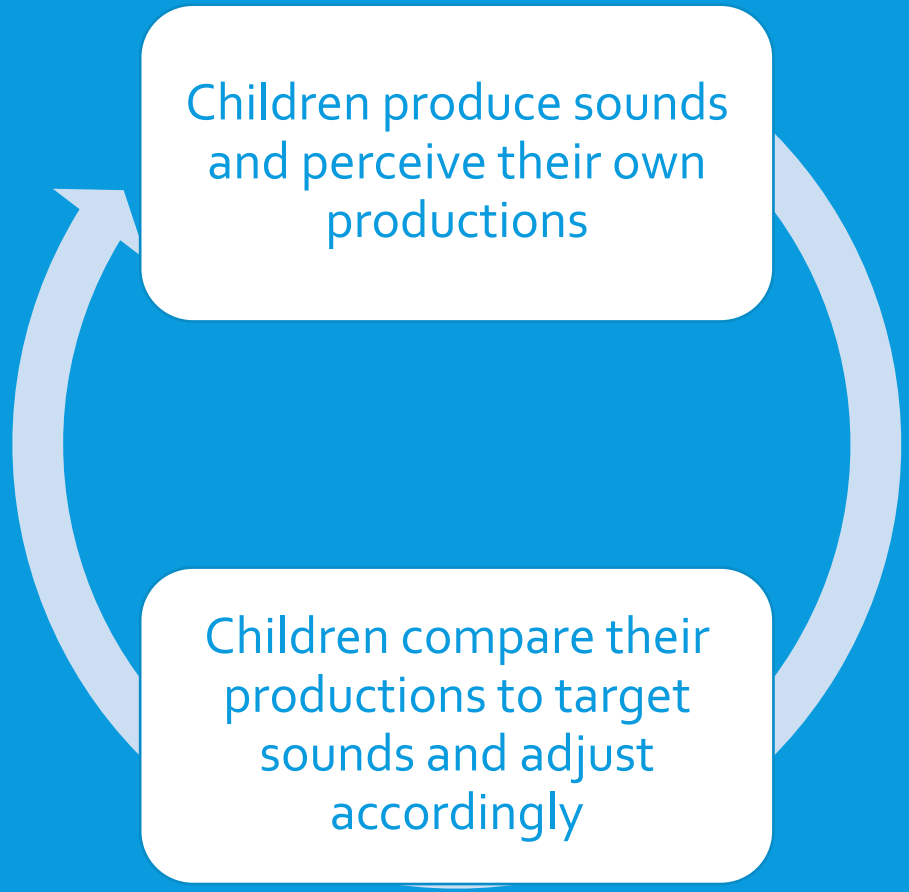
PRELINGUISTIC DEVELOPMENT



PRELINGUISTIC DEVELOPMENT

- During prelinguistic period, children form representations that enable them to produce and understand words of their language
  - Cognitive-linguistic component

- Children are exposed to an articulatory-auditory "feedback loop":
  - Development of speech-motor skills



FROM BABBLE TO WORDS

- Ability to understand and produce words depends on the presence of underlying representations of the words
  - No evidence whether children's representations are adult-like or less detailed

- Phonetic inventory between onset of meaningful speech and a 50-word vocabulary consists of a small repertoire of consonants and vowels and a simple syllabic structure
  - Rare or difficult consonants usually do not occur
  - Consonants are mainly stops, nasals and glides
    - ➢ Babble as the basis for words

PHONOLOGICAL DEVELOPMENT BEYOND THE FIRST-WORD STAGE

- First-word stage ends around 18 months
  - Increase in vocabulary size and syllable shapes
  - Onset of two-word utterances
- At approximately 24 months:
  - Vocabulary of 250-350 words
  - Multiword sentences
- Children's phonological system can be described in two ways:

Independent analysis:
- No reference to adult productions
- Focus on phonetic inventories

Adult-child comparisons:
- Compares the productions of children and adults
- Used to examine the accuracy of learner's productions

PHONOLOGICAL DEVELOPMENT BEYOND THE FIRST-WORD STAGE

- Errors made by children are very systematic:
  - Omissions:
    - Last consonant is often omitted (CV instead of CVC – "ca" vs."car")
    - Producing one consonant instead of cluster of consonants ("bue" vs."blue")
    - Unstressed syllables are often omitted ("nana" vs."banana")
  - Substitutions:
    - Fricatives and affricates produced as stops ("bery" vs. "very")
    - Velar stops produced as alveolar stops ("do" vs. "go")
    - Liquids produced as glides ("wight" vs. "light")

➢ Adheres to CV pattern during babbling

➢ Adheres to consonant preferences during babbling

RELATIONSHIP BETWEEN PHONOLOGICAL AND LEXICAL DEVELOPMENT

LEXICAL SELECTION IN EARLY WORDS

- Individual abilities and preferences influence the type of early words:
  - Preferences for words with sibilant consonants (Ferguson and Farwell, 1975):
    - ice, shoes
  - Preference for words with velar stops (Stoel-Gammon and Cooper, 1984):
    - milk, clock, talk, walk, frog, block, etc.
  - ➢ Words that are consistent with a child's phonological inventory are produced more frequently
  - ➢ IN words vs. OUT words

THEORETICAL APPROACHES TO PHONOLOGICAL DEVELOPMENT

STRUCTURALIST THEORIES

STRUCTURALIST THEORIES

- Focus on establishing structural grammatical laws that are based on the analysis of spoken language

- Major claims:
  - Discontinuity between prelinguistic and linguistic vocal development
    - Babble as a "purposeless egocentric soliloquy"
  - Phonological development begins with the beginning of true speech
    - "Phonetic abundance" is replaced by "phonemic poverty"
  - "Irreversive Solidarity": Order of phonemic acquisition is universally fixed
    - Presence of fricatives implies presence of more "basic" stops

  ➢ Partially proven to be wrong nowadays

STRUCTURALIST THEORIES

Strengths

- Explains general patterns observed in phonological development of children
  - "Irreversive Solidarity"
  - Still important for classification of phonological disorders

Weaknesses

- Findings are based on anecdotal claims and diary accounts
- Discontinuity between babble and speech is a false assumption
- Inter- and intra-child variability is ignored
  - Universal order challenged by individual differences

RULE- AND CONSTRAINT-BASED THEORIES

GENERATIVE PHONOLOGY

- Differentiation between competence and performance
  - ➢ Focus on competence

- Major claims:
  - Innate mental endowment used by children to acquire language
    - ➢ Universal Grammar (Chomsky)
  - Child's underlying representations are adult-like
  - Features as basic units of phonological representation
  - Existence of strictly ordered, obligatory realization rules
  - Development as rule modification applied to stable representations

GENERATIVE PHONOLOGY

Strengths

- Ability to capture patterns between adult targets and child productions
  - E.g., deletion rules explain why certain structures are absent
- Features help to generalize patterns efficiently

Weaknesses

- Assumes fully developed perceptual abilities at the onset of speech
- Does not explain the role of prelinguistic vocalizations
- Downplays the importance of language input
  - Language is learnable and therefore innate

NATURAL PHONOLOGY

- Each child is born with a universal set of innate phonological processes
  - ➢Dictates form of phonological productions
  - ➢Development consists of suppressing and reordering processes according to input

- Advantages compared to generative phonology:
  - Defines what is innate more clearly
  - Explains nature of child productions with physical attributes of speech mechanisms

CONSTRAINT-BASED APPROACHES

- Differences compared to generative phonology:
  - Constraints instead of fixed rules
    - Faithful constraint: Aim for similarity to the adult form
      - ➢ May be violated
  - Language acquisition as a process of reranking constraints to match adult forms

- Advantages compared to generative phonology:
  - Constraints operate during babbling and early speech
    - ➢ Accommodates transition from prelinguistic to linguistic stages
  - Individual differences are explained by randomness in initial constraint ranking

CHILD-CENTERED THEORIES

PROSODIC THEORY

- Questions idea of feature / phoneme being the basic unit of representation for children
- Perception and input play a major role
  - Perception and production develop together
  - Representations are not adult-like because perception is not adult-like
- Children differentiate between structure types during acquisition:

Child perceives a schema for words with similar structures and reproduces the salient characteristics

Example: Sibilant final consonants: “fish”, “fetch” and “brush”

Child’s realizations depend on perceived realizations and on the child’s output system

PROSODIC THEORY

Strengths	Weaknesses
• Accounts for the role of perception and input • Accounts for the recognition of specific phonological patterns by the child (schemas)	• Does not account for typical order of phonological acquisition

COGNITIVE THEORY

- Assigns an active role to children:
  - Form words based on articulatory abilities
- Test and revise hypotheses concerning phonology based on experience
  - Selectivity in word choice by children
- Refuses the impact of systematic rules and highlights the importance of the lexicon
  - Reflecting the linguistic experiences and preferences of a child

COGNITIVE THEORY

Strengths

- Accounts for intra-word variability
- Accounts very well for individuality in language acquisition

Weaknesses

- Does not explain systematic correspondences between child-productions and adult forms

BIOLOGICAL THEORIES

BIOLOGICAL THEORIES

- Language acquisition depends on anatomical and motor development
- Major claims:
  - Motor functions are genetically determined:
    - Early productions are limited by motor ability
  - Production of early words as "motor scores"
    - Precision and consistency of productions increase with motor development
  - Fundamental difference to other theories:
    - Child progressively extends its abilities and does not suppress certain features of a fully developed phonological system

BIOLOGICAL THEORIES

Strengths

- Accounts for continuity between prelinguistic and linguistic production
- Explains variability in production
- Explains universal patterns of phonological acquisition

Weaknesses

- Child is depicted as a passive learner

USAGE-BASED PHONOLOGY

USAGE-BASED PHONOLOGY

- Focus on the interplay between language use and structure
  - ➢Language use shapes the linguistic sound system
- Major claims:
  - Phonological development is interconnected with the use of individual words in the lexicon
  - Word frequency:
    - High frequency words are easier to perceive and produce compared to low frequency words
  - Neighborhood density:
    - Dense neighborhoods may require more detailed phonological representations
    - High density neighborhoods help phonological acquisition

USAGE-BASED PHONOLOGY

Strengths

- Accounts for the role of input in phonological acquisition
- Explains the existence of lexical effects

Weaknesses

- Presents conflicting results concerning lexical factors in phonological development

CONCLUSION

Theory	Key Concepts
Structuralist Theories	Innate structures
Rule- and Constrained-Based Theories	Innate rules, processes or constraints
Child-Centered Theories	Perception and input form basis of acquisition
Biological Theories	Motor development forms basis of acquisition
Usage-Based Phonology	Strong interplay between language use and structure

- Each theory comes with strengths and weaknesses regarding the modeling of phonological acquisition
- No theory accounts for all phenomena that can be observed in phonological acquisition