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Pre-linguistic Development in Infants - Perception and Production

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Two Overlapping Periods

The process of child language development is concerned with clear demarcations of stages in language development and the actual strategies adopted to acquire language at each stage. This language development can be divided in to two continuous and over-lapping periods of verbal behaviour.

a. **The pre-linguistic period**
b. **The linguistic period**

Focus of This Paper

This paper discusses on the pre-linguistic development in language acquisition which includes the infant's ability to perceive linguistic stimuli or the infant speech perception which is defined as the ability to perceive speech before the recognition that such speech conveys meaning. And the infant's speech production which refers to the infant's ability to produce speech like vocalizations before they are giving linguistic meaning by the infant.

First Word Onset

Stern defined 'the end of pre-linguistic development as the onset of the first word in production'. The pre-linguistic phase is the time period before children say their first meaningful words which lasts from approximately 0-13 months. (Shaffer, 2002).

Development of Speech Perception

Children seem to be born with a perceptual system that is especially designed for listening to speech. New-borns respond differently to human voices than other sounds. From around one month of age children exhibit the ability to distinguish among certain speech sounds.

Categorical Perception

Psycholinguists made a major discovery of the fundamental cognitive mechanism for speech perception is categorical perception i.e., we do not perceive the speech stream as continuous. We automatically categorize speech sounds. Our ability to identify the speech sounds appears to regulate our ability to discriminate them. One-to-four-month-olds discriminated a contrast between [a] and [i] even when there was continuous variability in pitch of speaker's voice (Kuhl:1976). Two-month old detected change between words like 'bug' and 'dug'(Jusczyk:1997). Also detect /p/ and /b/ in [pa] and [ba] (Eimas:1971). Even more amazing is the fact that infants are able to distinguish between sounds in unfamiliar languages. They perceive a wide rage of array of linguistically relevant sound distinctions extending beyond those which are significant in the native language. Despite this early sensitivity to contrasts among speech sounds, children cannot initially distinguish between meaningful words. The mapping to the specific language phonology is occurring by six months, and that changes in speech perception continues to develop over the infant's first year of life.

Sensitivity to Suprasegmental Units

Sensitivity to suprasegmental units also develops over the first year. Duch infants of nine months distinguish between phonologically legal and non-legal clusters. (Frideric and Wessels, 1993). Infants as old as four days are sensitive to the difference between bisyllabic and trisyllabic items (Bertonciji and Mehler,1993)

Infants are also capable of intermodal linking of auditory and articulatory information regarding speech vary early. Infants share with adults basic mechanisms and organizations of speech perception, but an ability for an intermodal connection of articulatory and auditory information regarding speech.

Development of Speech Production

All infants, in all linguistic communities, pass through the same stages of early vocal development. These stages are not discrete, and vocalizations from previous stages continue to be used in subsequent ones. Pre-linguistic language development can be divided into three stages of categories:

a. Stage 1 Crying or phonation

b. Stage 2 Cooing

c. Stage 3 Babbling

Stage 1 (0 to 2 Months): Crying or Phonation

The first stage is characterized by productions that bear little resemblance to speech. The vocal behaviors of this stage consist primarily of reflexive (sometimes called 'vegetative') vocalizations, such as crying, fussing, coughing, sneezing, and burping. These vocal types are referred to as 'reflexive' because they involve automatic, involuntary motor patterns. Some nonreflexive vowel-like productions occur at this stage. Psychologists have managed to distinguish types of crying:

Hunger cries: The cry starts as a quiet and intermittent cry which gradually becomes louder and more rhythmical.

Angry cry: the angry cry follows the same sequence as the basic crying pattern, but which is characterized by distinct lengths of sound and pause.

Pained cry: The cry of pain is sudden and loud from the start and consists of a long cry followed by a long silence, then a series of short gasping sounds.

Fake cry: Crying to draw attention

Stage 2 (2 to 4 Months): Cooing

In cooing infant increase control over voicing and the vocal tract. Cooing stage is generally as from two to four months. At around two months, the baby will engage in cooing, which mostly consists of vowel sounds. In this stage child often produce coo's or comfort sounds when having face to face interactions with a caregiver. 'Coos' are characterized by nasal resonance and are generally perceived as containing vowels and consonants produced at the back of the mouth (velars, uvulars) and back vowels. Consonant–vowel syllables occur in this period lack the timing of opening and closure gestures found in syllable timing of adult speech.

Stage 3 (5 to 8 Months): Babbling

At around four months, cooing turns into babbling which is the repetitive consonant-vowel combination. An important milestone in linguistic development is the onset of babbling at around 8 months of age, a precursor to language consisting of syllable sequences like ba ba ba. Infants show more spontaneous vocalization when alone than when with others (Locke 135, 1993), suggesting that babbling is internally driven.

An early period of marginal babbling develops to canonical babbling, then variegated babbling (ten to fourteen months), followed by first words (twelve months). This development is not in clear stages but continuous, with overlapping forms occurring even between babbling and words.

a. Marginal Babbling (5-6 months)

Babbling might constitute a form of "vocal play," including "exercise of the organs of speech" (Kent 1981, 113), a purely motoric exercise which manipulating pitch, loudness etc. This would predict a general developmental course in types of articulation in babbling, independent of the ambient language. Marginal babbling identified as four to six months. This stage contains CV or VC pattern. It is considered as a type of pre-canonical vocalization along with cooing.

/ma/ /ta/

b. Canonical Babbling (6-10month)

Later infant start to make extended sounds that are chopped up rhythmically by oral articulations in the syllable like sequences, opening and closing their jaws, lips and tongue. This is called canonical babbling. Canonical babbling is identified as from six months to ten months. In this stage infants began to use variety of sounds and sound combinations.

Next the child learns to repeat the sounds or reduplicates them. In this stage parents help the child in associating sounds with objects by talking the advantage of talking such as 'meou meou' for cat and 'bow bow' for dog etc. The child also learn to symbolize during this stage. Canonical babbling is also known as **Reduplicated babbling**

In reduplicated babbling infant repeat the same syllable over and over.

/ba ba ba …/

/me me me…/

/pa pa pa…../

c. Variegated babbling (10-1 month)

This is a type of re-duplicated babbling in which child produces a series variety of consonants and vowels co-occur. There is variation and complexity of syllables. Consonant repertoire increases substantially but stops, nasals and glides are still most frequent.

e.g. /bawidema/.

d. Canonical babbling with jargon speech (12-18 month)

After canonical babbling infant's babbling slowly starts resembling adult speech even though he may not be using real words. Child uses normal syllabic strings, more varied intonation patterns, and overlaps with child's true first word. This babbling is referred to as jargon.

First Words

First words typically appear during the period of canonical babble, and babble and speech coexist. By the age of 18 months, the proportion of babbled utterances has declined markedly, and words and short phrases begin to predominate. Babble and early words share the same phonetic properties in terms of sound types and syllable shapes (Stoel-Gammon, 1992). The consonants that occur most frequently in canonical babbling – stops, nasals, and glides – are the same sound classes that predominate in early word productions, and the manner classes that are infrequent in babble – namely liquids, fricatives, and affricates – are precisely those that appear later in the acquisition of speech. Moreover, the CV syllable structure that is characteristic of the canonical babbling period is also the most frequent syllabic type in early word productions.

Speech Perception and Speech Production

Developments of infants' speech perception and speech production correlate; both reveal infants mapping to the sound system of the ambient language during the first twelve months. In phonological language acquisition a new-borns must convert a continuous speech stream into unit of sound which provide a digital representation of language, and must create a representation of how these units are sequentially and systematically related. This analysis of the speech stream and a "combinatorial principle" which applies to the sound units are necessary for children to both produce and perceive any of an infinite number of possible new words and sentences. Discovering the essential units of the sounds of a language and their system of combination, of a language, is a necessary and primary step in "cracking the code" of the language surrounding the child (Barbera, 2006)

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