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Development of Auditory Skills, Speech and Language in Typically Developing Children in the Age Range 0-5 Years

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Abstract

Language is a set of symbols, which is used for communication. It is a means to express ideas and communicate wants and needs. Language is partly innate and partly learnt. Speech is one of the means to express language, the others being gestures, pictures etc. Auditory skills are an essential prerequisite to develop language (verbal) and speech.

This article briefly brings forth the normal developmental stages of auditory skills, language and speech sounds in typically developing children from birth upto five years of age. In auditory skills, there is a change from developing just orienting responses (to environmental sounds) to a sustained attention to speech. In the receptive language domain, there is an increase from comprehending simple commands to complex ones. There is an increase in comprehension in the of variety of question forms and discourse comprehension. In the expressive-verbal language domain, there is an increase from first word to phrase production to sentence level utterances. Subsequently, lengthy descriptions and narration are produced. In speech sound production, vocalisations and vowels predominate the beginning and gradually all the phonemes in the particular language are acquired.

Keywords: Auditory Skills; Speech Development; Language Development.

Introduction

Verbal language is often (predominant) the mode of communication in humans with peripheral hearing and auditory receptive skills being its essential prerequisites. The development in humans, of receptive and verbal language can be observed in each of the domains of language i.e. phonology, morphology, syntax, semantics and pragmatics throughout the childhood. For the complexity of these developmental processes to progress in a coordinated manner with other cognitive skills, intact central nervous system is essential. The other significant factors that influence language development are critical period, cognitive skills, intact and functional auditory system, oral-vocal musculature and the environmental stimulation.

Given that the in human beings hearing begins in the foetal period, i.e. around four months before birth, the sensitivity at birth to auditory stimulation is quite high which in turn tunes them to acquire verbal language. In the developmental period, the child may be exposed to one or more languages and consequently acquisition of predominant one or all of these languages can occur. Each of these languages which the child acquires are seen to follow through similar developmental stages. There could be a mixture of these languages in the production in a few situations. And language being the primary medium of knowledge acquisition and also social interaction, a delay in acquisition of language can impact both social aspects and academic aspects.

The following are the stages of normal development of auditory skills, language and speech in children.

Pre-Natal Period

Cochlea in human beings is fully developed by 20 months of gestation [2]. Responses to the auditory stimuli can be observed as early as 26 to 28 weeks of gestation [1, 8]. Though limited phonetic information is available to the fetus, however, the intonation patterns are well transmitted for the fetal perception [8]. Studies have reported fetal heart changes and movements for sounds [5, 8]. Hence, hearing constructs the basal pre-requisite to acquire language even before birth.

First Three Months

Auditory Skills

At birth child responds to the environmental sounds by eye blink, eye widening or startle response to loud sounds. Further child exhibits preference to mother's voice. By three months, the infant starts attending to speech by paying attention to the intonation pattern [7].

Language and Speech Skills

The non-reflexive, pleasurable, vocalisation of phonation and cooing stages are emergent. In the "phonation" stage (0-1 month) infants are found to be vocalising with adequate phonatory control but with limited resonance i.e. produced with a closed or a nearly closed mouth. In the cooing stage or the "goo" stage, the back of the tongue sounds like [u] are produced [6]. Subsequently, child produces single syllables.

Four-Six Months

Auditory Skill

Initially child moves eyes in the direction of sounds followed by rudimentary head turn and in the horizontal direction.

Language and Speech Skills

At the receptive level, by four months of age, the baby is capable of following the suprasegmental aspects to detect the different moods of a speaker. By five months of age, children begin to respond to their own names and later can recognize the commonly used names of family members [7].

At the expression level, the child develops vocalisation for pleasure as well to show displeasure. It ceases to vocalise when adult enters the room. There is an exploration of the vocal mechanism through self-initiated vocal play by squealing, growling, yelling and making raspberry vocalisations and is referred to as the "expansion" stage. Adult –like vowels begin to appear [6]. Cannonical babbling also appears by six months wherein there is repeated sequences of syllables [bababa], [mamama] etc.

Seven-Nine Months

Auditory Skills

By eight months, attention to auditory based activities improves [7]. The child would now be able to locate the sounds to the sides, however not above and below correctly. The child would respond to songs by making to and fro body movements or clapping and would enjoy playing peek-a- boo.

Language and Speech Skills

Understanding of speech (receptive language) advances and the child becomes sensitive to regularities in word-boundaries. The canonical babbling of repeated sequences of syllables, in expression, continues (upto 8 months). It is this stage that parents often mistake for "talking" although there is no meaning attached to the syllable sequences. Canonical babbling depends on auditory exposure, in addition to the physiological maturation. There is a usage of wide variety of sound combinations, including those not in the repertoire of the child's native language. Variegated babbling emerges at this stage [6].

Ten-Twelve Months

Auditory Skills

By the end of twelve months the child would be able to locate sounds in all the planes. Auditory attention to speech continues to expand to understand speech.

Language and Speech Skills

The child can understand a few simple requests and uses pointing, gestures and vocalisations as responses. The production of variegated babbling

continues in this period. It has adult –like syllables wherein within an utterance, there is more than one type of syllable such as [hatahata], [tekatehaka] etc. The following stages i.e. from one year upto five years have the details of development of language and speech skills put forth by Gard, Gilman and Gorman (1993) [3].

1 – 1 ½ Years

The understanding continues to be built up. The child acquires its first word. Subsequently a vocabulary of upto 20 words is acquired of which 50 percent are nouns. Yet the child relies mostly on pointing, gestures and vocalization for communication or expressing wants and needs. Negation starts to emerge and a reply to question of "what is this" can be observed. They also start using sentence like intonation that mainly consists of jargon.

1 ½ - 2 Years

The child's receptive vocabulary is around 300 words. At the sentence level, he/she can understand commands and a few simple questions too. The expressive vocabulary has grown to about 50 words. The child starts putting words together to form sentences or two word phrases. The child speaks his/her own name; begin to uses pronouns like 'I, me and u', although he's confused in 'I and me'. He names familiar objects, uses verbs, a few adjectives and asks questions. At this time about 65% of speech is understandable (to others) or intelligible and most of the jargon is gone.

2-2 ½ Years

The child's listening abilities with respect to memory constantly improves and in a rapid fashion. The child can understand around 500 words and speaks around 200 words. The child knows all chief body parts at this age and will point to them when asked to, even name them and answer questions such as "what do hear/see with". In general, the child can answer 'where', 'what …doing' questions. The grammatical morphemes at end of words found are present progressive, plurals and irregular past tense. Auxiliary -and, they are achieved. Speech intelligibility is increased to 70%.

2 ½ -3 Years

Child can understand approximately 900 words. Understanding of more variety of questions with "who, why, where and how many" emerges, at a rudimentary level. In expression, vocabulary is increased to 500 words. Verbs begin to dominate. The speech would also include adjectives – big/little; prepositions– in, on, under; and auxillary –is, am,-ing; third person pronoun morpheme- 's', and possessives –mine. The usage of gestures are reduced and are replaced by –'that or it', when referring to an object. Child is able to state his own gender and age. The child starts using more variety of questions. The utterance length is now increased to 3-4 words. The child is able to recollect events with reference to person and place. 80% of the child's speech is intelligible. The speech sounds mastered include p,m, n, w and h.

3-3 ½ Years

Child comprehends about 1200 words and understands 'how' questions. Child uses 'what' and 'who' questions. Appropriate usage of plurals i.e. 'is' and 'are' is observed. Complex sentences are formed.The child has a mean length of utterance of 3-4 words. Narrative skills emerge.

3 ½ -4 Years

Child comprehends about 2000 words, responds to 3-step commands involving actions, understands 'how-much' and 'what if' questions and can remember sequence of events. Child's vocabulary increases to 1800 words; uses locatives of 'up, down' in the sentences; starts asking 'how, why and when' questions; uses comparative words like –bigger; uses more conjunction words like, because,so,and if. The child forms frequent complex sentences, can tell a story but with little distinction between fact and imagination. Requesting permission is also noted and the child corrects others. The utterance length at this age is about 4.4 words. By this age the speech sounds mastered include b,d,k,g,f and y.

4- 4 ½ Years

By this age child acquires colour concept; understands 'before, after' used in narrating sequence of events; understands opposites like above, below, top and bottom to tell location of the objects; and fairly understands 'how far' questions. Concept of 'number' is much better at this age.

Child starts talking about past and future events. Child correctly uses irregular plural, past tense and third person pronoun. Child now speaks not only active sentences but passive sentences also appear. Conjunctions like 'if' and 'so' appear in the sentences.

Child starts using "what do... does... did..." questions. The mean length of utterance at this age is around 4.6 words. Child at this stage understands situation and maintains his vocal volume according to it. Child starts making request in more indirect ways. Turn taking in conversation is improved. Child begins to use language to tease and tell jokes. Connected speech is intelligible.

4 ½ – 5 Years

The child's understanding continues to increase wherein executing three commands in sequence is feasible, comprehends a variety of adjectives, comprehends questions involving "how long" and "how often" issues. The expressive vocabulary is also constantly increasing and has reached 2500 – 2800 words. The child can say the days of the week in correct order, is also able to use possessive pronouns such as "his" and "hers" along with reflexive pronouns. Most of the speech sounds are now mastered.

The child's language, thus, continues to grow. Its growth can be observed in both the first and the other languages the child is exposed to. If there is a discontinuation in the exposure and usage of any one of the languages, then the child may or may not retain the acquired linguistic skills of that language, in due course. In speech sound production, by six to seven years, sounds such as - ing, r,l,sh,ch,j are mastered and by eight years, voiced th, v,s,zh sounds are mastered.

Conclusion

At birth, the child's sensory systems and neural network are ready to receive inputs, depending on the environment and with the intact oral-vocal structures; they begin the production of vocalisations. There is a consistent increase in sensitivity to sounds; be it environmental or speech sounds. Comprehension continues to grow and this precedes the expression, on the various domains of language. There is a consistent expansion in verbal production.

Beyond five years too, the language skills continue to improve wherein the comprehension of complex series of utterances is feasible; judgments are made; appreciation of humour and telling lies develop and metalinguistic skills get refined. In speech sounds production too, the child acquires all the speech sounds of the language (s) he is exposed to.

References

1. Chelli, D & Chanoufi, B. Fetal audition myth or reality. Journal de Gyneìcologie, Obsteìtriqueet Biologie de La Reproduction. 2008; 37(6): 554–8.
2. Elliott,G. B, & Elliott, K. A. Some pathological, radiological and clinical implications of the precocious development of the human ear. Laryngoscope. 1964; 74: 1160-1171.
3. Gard,A, Gilman, L & Gorman, J. Speech and Language development Chart.2nd Edition. Austin,TX:Pro-Ed, Inc, 1993.
4. Hepper,P. G., & Shahidullah, B.S. Development of fetal hearing. Archives of Disease in Childhood. 1994; 71(2): 81–87.
5. Johansson,B, Wedenberg, E, & Westin, B. Measurement of tone response by the human foetus. A preliminary report. ActaOto-Laryngologica. 1964; 57: 188–92.
6. Oller, D.K. The emergence of sounds of speech in infancy. In G. Yeni-Komshian, J.Kavanagh and CA. Ferguson (Eds.) Child Phonology, Volume 1. Production. New York: Academic Press, 1980.
7. Perigoe,C.B & Paterson, M.M. Understanding auditory development and the child with hearing loss. In Welling, D.T and Ukstins, C.A (Eds.). Fundamentals of audiology for the speech language pathologist. Burlington,MA: Jones and Bartlett Learning, 2015.
8. Querleu,D, Renard, X, Versyp, F, Paris-Delrue, L, &Crèpin, G. Fetal hearing. European Journal of Obstetrics, Gynecology, and Reproductive Biology. 1988; 28(3): 191–212.