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DIAGNOSTIC ASPECTS OF SIMPLE SPEECH RETARDATION.

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Introduction

Children with speech retardation (language disorders, language impairment) make up a considerable part of the patients in phoniatric practice. Out of a yearly case-load of about 1800 new patients at the department of phoniatrics in Malmö, about one third are children with language impairment. The incidence of speech disorders in the population varies with age. In extensive European studies it has been found to be in the magnitude of 10 % at age 4½ years and of 5 % at age 6½ years.

The reasons to bring a child to diagnostic assessment for a speech disorder may vary, as may the questions which the "diagnosis" is expected to answer. Very often the consultation is initiated by the parents who worry that their child cannot speak out the words properly or maybe not even make himself understood but to the closest family members. Frequently they ask, if the child should have surgery to loosen his tongue-tie or if he should have taken out his tonsils to get out the voice more clearly.

Obviously, non-professionals - and most parents are - have difficulties in analyzing the complicated function of speech and usually they conceive it in a too concrete way. Even if a normal voicebox and normal articulators are necessary prerequesites for normal speech, this is not sufficient. The child also must develop the ability to master the rules of the language spoken in his community, be it the rules of pronunciation, of word usage or of sentence construction (phonology, morphology, syntax). Non-professionals seldom appreciate (until they are told) that most speech defects emanate from an insufficient mastery of the rules of pronunciation,

that they as a matter of fact are symptoms of impaired language, and that there is nothing wrong with the motor function of the articulators. Finally, the child must have reached a certain level of mental maturity so he can develop concepts about himself and his environment to be coded in his spoken language. And he must be emotionally motivated to communicate.

So, many parents´ worried question "What´s wrong?" can be restated into an "Is there anything wrong?" and - allowing for normal developmental variations - be denied. However, here lies a great danger. All too often, the advice to the parents is just to wait and see. The trust that the child´s speech will develop normally may be based on a too superficial assessment and therefore ultimately turn out to be wrong.

In other cases, usually referred from pediatric specialists or from nurseries, it is obvious that something is wrong with the child´s speech development and the reasons might be as obvious, like a hearing impairment or a mental deficiency. Here the question to be answered after the diagnostic assessment is not so much "What is the cause?" but rather "What should be done?".

Consequently, in order to be efficient, diagnostic work with speech impaired children cannot be restricted to "differential diagnostics" in a medical sense. It should be as plurilevel as the speech function itself and be based on a psychological and linguistic assessment as well as on a medical examination.

Developmental aspects.

If we want to examine speech development from its very beginning, we

must look not at the child´s first uttered words but to his entire cognitive development from the moment he is born. Studying videotapes of infants Condon and Sander (1974) concluded that "the neonate participates immediately and deeply in communication and is not an isolate which slowly develops such skills after many months".

The attachment between the infant and his parents is strengthened by aid of facial expressions. At six weeks infants normally start to smile at human faces and some weeks later the smile can be controlled sufficiently to be used in order to interact with the mother. Such patterns of interaction have been studied by Stern (1974), who described five basic expressions as being typical for the mother´s way to communicate: the neutral expression, the smile, the frown, the "mock-surprise" and the "oh, you poor dear" expression. Long before single words can be uttered, the child learns the conventions of attention, response-making, and turn-taking, etc., the same which govern the conversation between adults.

The effect of parental behaviours on the formation of attachment and subsequent cognitive and social development, the attainment of social skills, and the acquisition and use of spoken language by the child is far from clear. However, most parents´ sound instincts should be frankly acknowledged, that "the infant is much more than something to be fed, kept clean and warm, and otherwise left in his carrycot to stare at nothing more stimulating than the kitchen ceiling" (Martin, 1981).

The very first use an infant makes of his speech- and voice-organs is by crying. Infant cry has attracted some interest for the study of cerebral lesions and chromosomal abnormities as described in the

"cri du chat" syndrome. Trials to distinguish different qualities of cry, such as cry caused by pain, anger, or hunger, have not been successful, whether the cries were analyzed acoustically or evaluated perceptually by the mothers. In a study of cries from seven children of both sexes, aged 0 - 41 days, Martin (op. cit.) reached the conclusion "that the temporal characteristics of crying are innate and arise from the mechanical features of the respiratory tract, the chemical changes taking place in the circulating blood and pulmonary alveoli and rhythmical vocal patterning organized at a neurological level". Therefore, it is doubtful if the cry should be considered a basic stage in the development of speech.

This rather seems to be the case with babbling. During the first six months of life, babbling is an internally stimulated playful activity of the voice organs. It does not depend on the child being able to listen to himself. Even severely hearing impaired infants adopt babbling. The continuous development of the "neuro-vocal" activity of babbling has been studied in detail by Martin (op. cit.), who suggests a special terminology for different segments of babbling.

After the first six months of life the child starts to understand an increasing number of words addressed to him and to become aware of the sounds he is producing himself. A circle reaction is started, where the child stimulates himself acoustically and kinaesthetically to repeat the same syllables. Severely hearing impaired children stop babbling at this stage from lack of acoustic feedback. Normal children begin to imitate sounds in their surroundings, and - the parents usually enjoy imitating the baby. From about 9 months of age children start to utter long sequences with normal speech intonation but not

understandable (jargon speech). When the same sequence of sounds is used regularly in connection with the same kind of reality (like "mum-mum" for food, for the mother supplying it, and for the cup) the sound sequence functions as a sign for that reality. From this point on, the development of speech in the sense of spoken language has started.

Most children start to use one-word utterances at the time of their first birthday. At this age the cognitive concepts of the child are still insufficiently differentiated and the semantic categories are still vague. The one-word utterances often have a slightly different meaning than the same words in adult language. Usually, they function as entire sentences, where the precise meaning becomes clear first from the situational context and non-verbal communication. From about two years of age children use combinations of two words, connected by the rules of a rudimentary grammar.

There is a parallel development of the different aspects of language although the variation between individuals is considerable. At an age of three years most children can pronounce the labial plosives and nasals correctly, they have a vocabulary of about thousand words and a mean sentence length of slightly more than three words, consisting not only of nouns and verbs but of adjectives and pronouns as well. Grammar becomes more and more complex. Between age four and five years most children have developed a complete mastery of their first language, even if they might still mispronounce some difficult phonemes and their vocabulary is restricted compared to the adult.

From this description of the normal development can be deduced some

guidelines as to the indication for an expert assessment of language impairment. This should be carried out:

1. If a toddler of 18 months age does not speak any words at all.
2. If a child aged three years does not form any sentences and cannot make himself understood within the family.
3. If a child aged four years cannot make himself understood to foreigners.
4. If the average number of words in the sentences uttered by a pre-school child is less than he is years of age (rule of thumb).
5. If the child cannot speak out the words correctly or construct correct sentences (dysphonology or dysgrammatism) one year before starting school.
6. If the child or his parents are in any way worried about the function of his speech.

Syndrome aspect.

In a medical sense to make a diagnosis often means to search for the causal factors of the deficiency. Once the etiology is established, the consequences as to adequate therapy and the final prognosis can be drawn rather confidently. In order to acquire normal speech it is generally felt that the child needs normal hearing and sight, normal speech-organs, normal neuro-motor function, adequate mental abilities, emotional stability and satisfactory exposure to language. The clinical etiological categories for language impairment have been related to deficiencies of each of these factors.

Hearing impairment and deafness.

Every child with impaired speech should pass a thorough audiological assessment of auditory sensitivity and middle ear function. The

audiometric testing must be carried out in a quiet environment. Pure tone screening tests under noisy conditions in schools fail to identify mild hearing loss which might be pertinent for the child´s language impairment. Severe hearing loss and deafness as a rule is recognized already during the child´s first year of life. Many countries have developed special screening programs for high-risk infants including heredity for hearing impairment, intrauterine rubella-infection, congenital defects like cleft lip and palate, severe haemorrhage especially during the first trimester, birth weight under 1 500 g, neonate asphyxia, and jaundice (serum bilirubin more than 20 mg/100 ml). The early hearing assessment in these cases as a rule includes electrophysiological tests like brain-stem audiometry and electrocochleography.

There is no simple relationship between the degree of hearing impairment and the defect of language acquisition because of the great variation of factors such as personality, intelligence, emotional stability, and social behavior. The sensory deficit of severe hearing impairment has an impact not only on speech acquisition and language processing but also on emotional development, on interaction and communication and on cognitive function. Besides the degree of hearing impairment the time of onset is a decisive factor influencing language acquisition.

In the rehabilitation of hearing impaired children the role of hearing aids is important but should not be overemphasized. Not only would it be "biologically naive to assume that feeding a sufficiently powerful signal into the inner ear will restore the function of the auditory pathways to normal" (Martin, op.cit.). As Martin also points out, there is a considerable intrinsic variation in the sound intensity level of

the speech signal, vowels and voiced sounds generally being transmitted by high energy content sections of the signal, whereas information about some consonant features is transmitted by so weak parts of the signal that it cannot be perceived by the child even with amplification from a hearing aid. If there is evidence, that the child will not be able to acquire normal speech from listening to oral language in his environment, energetic steps should be taken first to develop his non-verbal communicative abilities and an appropriate social interaction, and then to acquire codes for communication in the optical modality. These may range from the child´s own spontaneous system of manual signs and a learned sign language to written language. Some parents think, the child should not be taught to recognize letters and stop signing, otherwise he will never talk. They must be informed that all speech develops out of a general ability to communicate (even with gestures), and that the child should not be deprived development of his language even if he cannot manage the oral way.

In many children recurrent middle ear infection may be the cause of intermittent conductive hearing loss. In recent years there has been some concern that this may have negative effects on the children´s learning abilities and language acquisition. Paradise (1980) in a review paper states that "it does seem possible that in early life, critical and sensitive periods exist during which both auditory stimuli and auditory perception must be at optimal levels if there is to be full realization of the potential for later language, intellectual, and emotional development". However, the issue is still open to question as the research seems to be inconsistent. A general clinical impression is that these children mostly show some lack of attention and an immature phonology. In many cases this is rapidly compensated by

an accelerated pace of development starting immediately after the conductive hearing loss is cured.

Visual impairment.

Lack of visual imput can be the cause of delayed language acquisition in blind children even if only to a moderate degree (Schmidt, 1978). Such children may appear echolalic. Their speech may be grammatically well formed but seem empty of content.

Defective speech organs.

Organic lesions of the articulators are the most obvious causes of deficient speech and therefore, tend to be overdiagnosed. Usually the acquisition of language is not related to defects of the articulators. Quite often, children with defective speech organs adopt compensatory articulation like a labio-lingual pronunciation of /p/ and /b/, when the lips cannot be closed sufficiently, or even a plugging of a palatal cleft by aid of the tongue to establish sufficient intra-oral pressure for the correct articulation of plosives and fricatives. Sometimes the compensatory articulation causes an even more deviant pronunciation than the organic defect alone, like the glottal stop in cleft palate speech. An open b i t e or the loss of t e e t h may be the cause of lisping. On the other hand, the s-sound is often articulated correctly with the anterior parts of the blade of the tongue against the alveolar ridge. ´Language´ has ethymological connection with lat. ´lingua´, and many parents think of the t o n g u e as the most important articulator. Experience from surgery for carcinoma of the tongue shows that surprising small remnants of the tongue suffice to accomplish a rather normal articulation. A short tongue-tie might hinder the pronunciation of some dialectal variants in Swedish (the

supra-dentals). Otherwise, the indication to make a frenulotomy or better a frenuloplasty is not for speech but when the child has difficulties licking lollipops or cleaning his lips. This probably holds true for most languages. Hyperplasia of the t o n s i l s might be so extreme that the tonsils meet in the midline. In such cases a closed nasal resonance like "hot-potatoe speech" can be heard. The child usually is a mouth breather and snores when asleep. He might also wake up slowly in the morning from carbondioxide retention because of insufficient ventilation. A tonsillectomy is obviously indicated in such cases but should be an exception if the tonsils are not infected and there are no other medical reasons for surgery. The indications for a d e n o t o m y are much wider as adenoid vegetations in the nasopharynx not only lead to muffled speech but also might cause serous otitis and a conductive hearing loss. Congenital c l e f t s of the lips and palate are serious causes of deviant speech to be adequately handled only by a team of specialists, the maxillo-facial surgeon, the orthodontist and the speech therapist (phoniatrician and logopede in countries which have developed both specialties). The speech deficiency might be complicated by a conductive hearing loss from tubal insufficiency due to the cleft and from disturbances in central nervous function. The specialist responsible for the speech assessment in these cases should not focus on nasality only.

Neuro-motor disturbances.

There are numerous causes of infantal cerebral lesions, including infections, mechanical trauma, anoxia, and nutritional, chemical or metabolic factors. The spectrum of CNS disturbances is the same whatever the etiology of the lesion if it occurs during the gestational period,

during birth or during the first year of the infant´s life. Depending on the size and localization of the lesion it may cause perceptual or motor disturbances, impairment of intelligence, emotional instability and/or deviant behavior. Deficiency of speech and language might be the only sign of an early infantal cerebral lesion or be combined with any of the disturbances just listed. Among the motor disturbances the symptoms of spasticity, athetosis and ataxia can be distinguished. Usually they occur in combination and the causes for a deficient development of speech and language may be multiple in these cases. Problems to feed the infant may be the first symptom of disturbed motor function of the articulators causing dysarthria of the developing speech later, and the CNS lesions may cause impairment of hearing and language processing.

The examination of these children requires some experience and flexibility. They are often difficult to contact and it may be impossible to perform a formal examination in all details. The examiner may feel obliged to get down on the floor and play with the child to make informal observations of the child´s sensory and motor function, cranial nerves, attention span, affective behaviour, and communicative abilities. Repeated examinations may be necessary to get a secure basis for evaluation. Careful hearing tests are mandatory even if these children may have great difficulties to cooperate. The neuropediatric investigation may further comprise an electroencephalogram and examinations of metabolic functions and chromosomes.

The value of CT scans of the brain remains to be established as the lesions often are too diffuse to be visualized in the scans. Hier et al. (1978) studied brain asymmetry in CT scans and found that this

asymmetry was reversed in 9 % of right handed individuals and in 17 % of normal left handed individuals. Out of 24 dyslectic subjects, brain asymmetry was reversed in 10 cases, and Hier concluded that individuals with reversed brain asymmetry run a five times higher risk of having a language disability. In the future, magnetic resonance scanners with a highly increased resolution of the cerebral structures compared to CT scans might yield a more secure organic basis for the evaluation of cerebral malfunction.

Mental retardation.

Impaired intelligence may be congenital or acquired by early cerebral lesion. In mild to moderate forms of mental deficiency there is no simple relationship between the degree of mental impairment and the severity of the speech retardation. At an IQ of less than 40 a sentence length of more than two or three words cannot be expected and at an IQ of less than 20 language fails to develop (Lenneberg, 1967). The speech defects in mental deficiency include impairment of phonology and grammar as well as defective comprehension and dysfluencies.

Emotional disturbance.

Two syndromes of childhood psychosis are generally recognized, infantile autism and childhood schizophrenia, and disordered language is an important part of both. In the assessment of language impairment the syndromes of childhood psychosis must be considered seriously since the diagnosis will indicate psychiatric treatment. Infantile autism is characterized by an early onset and by a lack of emotional responsiveness to other persons as well as by rigidity and ritualistic behaviour and fascination with specific, maybe odd objects and rhythmical music. Consequently to the loss in general communicative

behaviour the development of language is retarded on all levels. Language is often not used for purpose of communication. Perpetually repeated words in immediate or delayed echolalia or bizarre neologisms rather function as symptoms of disturbed emotionality.

In childhood schizophrenia, which is of later onset, speech is characterized by deviation of rhythm and monotony of intonation. The language is emptied of content and stereotyped, with numerous repetitions.

Environmental factors.

Adequate exposure to language is one necessary prerequisite for normal language development in the child. Stories of so called wild children or wolf children having grown up in a language deprived environment unanimously describe the rudimentary language abilities of these children, but the most obvious example are deaf children who do not acquire language unless they are taught in the optical modality. Growing up under unfavorable domestic conditions or in an institution might deprive the child of opportunities to develop attachment in a communicative atmosphere as well as of sufficient exposure to spoken language. The result is an impairment of language development. Other unfavorable factors may be isolation in a twin situation or bilingualism. On the other hand, overprotection from anxious parents unwilling to expect any language capability from their children may have a negative effect. The same may hold true, if the child is confronted with too high demands.

The effect of the socio-economic state on language development seems not to be settled, probably because studies have been carried through

in countries with too different conditions. A general impression is that language development may be retarded initially in unprivileged families but that the difference is levelled out at an age of four or five years. The differences between "elaborated" and "restricted code" noted by sociolinguists may at least to some extent have emanated from confronting the children from the unprivileged classes with middle class language, a code they were not accustomed to.

The medically orientated taxonomy of speech and language deficiency syndromes described so far is generally accepted and seems to function reasonably well mainly for the purpose of organizing the care of language impaired children. However, it is not really etiological in the sense that causes like deafness or mental retardation could be cured to the effect that the language development would be normalized. Indeed from a study by Rosenthal et al. (1972) it can be questioned, if diagnostic categories of the kind discussed so far, are unique and independent of each other. Based on information from the medical, psychological and language evaluations in a diagnostic center, the study intended to assign children with deviant speech to one out of seven diagnostic categories. This turned out to be possible in only 82 out of 200 cases. Furthermore, cluster analysis of the data to determine coexistence between the variables used for diagnosis yielded only two clusters. One cluster included mental retardation and autism, the second cluster comprised hearing impairment, cerebrolesional language deficiency and organic maturational lag. So, many children seem difficult to fit into diagnostic syndrome categories and it seems questionable whether these categories explain the language impairment of the child.

Specific abilities aspect.

A possibility to avoid the questionable syndrome categories is to focus on the specific abilities and skills presumed necessary for normal language development. The emphasis is then not more on categorizing c h i l d r e n according to common behavioral syndromes but rather on categorizing the b e h a v i o u r s of the children. This approach is based on the assumption that there are specific abilities necessary for language development and that these abilities can be assessed and remediated.

Various models of language processes have been proposed to describe the necessary specific abilities. Basically, the models describe the signal processing flow from the sensory input via a perceptual to a cognitive level and from there via a motor control level to the vocal output. The models might include a feedback loop and emphasize on the auditory, visual and haptic modalities.

The most well-known instrument to assess a comprehensive number of specific abilities seems to be the Illinois Test of Psycholinguistic Abilities, ITPA (Kirk et al., 1968). The test battery includes twelve subtests to check both input and output in the acoustic and optic modality, at two levels of processing, the automatic level and the representational level.

Many of the specific abilities recognized as prerequisites for language function belong to the field of central auditory processing. The so called "central auditory abilities" have been listed as

follows (Keith, 1981, p. 95):

Localization (locating the source of sound)

Behavioral synthesis (integrating incomplete stimuli presented simultaneously or alternately to opposite ear)

Figure-ground (identifying a signal against a background of competing sounds)

Binaural separation (attending to stimuli presented to one ear while ignoring stimuli presented to the opposite ear)

Memory (recalling auditory stimuli, both in terms of number and sequence)

Blending (reconstructing words from separated phonemes)

Discrimination (judging whether two acoustic stimuli are the same or different)

Closure (reconstructing the whole word or message when parts are omitted)

Attention (listening over a reasonable period of time)

Cognition (establishing a correspondence between a sound and its meaning)

Other specific skills recognized as pertinent to language function are the ability to process a multisensory input (attention and integration of parallel auditory and visual stimuli) and volubility, the volitional and fluent execution of articulation, the impairment of which is named verbal apraxia by some authors.

The effects of time factors on auditory processing have been studied by Tallal and Piercy (1974). They showed that severely language impaired children had difficulty in processing brief and rapidly changing auditory stimuli, either speech-like or nonspeech-like,

whereas a control group had no such difficulties. A corresponding difference was not obtained with visual stimuli. If the duration of the stimuli was increased, as by artificial extension of the formant transitions for stop consonants, there were no deficits of discrimination. From subsequent studies the authors conclude that language impaired children are inferior to normal children in perceptual processing as well as in their rate of movement on repetitive and sequencing movement tasks. These variables were found to correlate highly with the level of receptive and expressive language functioning in the language impaired children (Stark and Tallal, 1981).

An interesting method to study the over all competence for selective listening has been described by Friedlander and Cohen de Lana (1973). They exposed five to eight year old children to audiovisual video playback of the Muppets with high verbal content. The children could choose between two sound tracks, one clear and the other hardly intelligible, because the speech was "degraded" by interfering multivoice "cocktail-party chatter". All the children showed the same high interest in the TV-programs and the majority consistently chose the clear sound track. A minor group, however, turned out to be non-selective listeners accepting the incomprehensible sound track even if the clear sound was freely available simply by moving a switch. The group of non-selective listeners were independently rated as having reading difficulties. In similar tests, language impaired children have been shown to be non-selective listeners with a high tolerance to "linguistic garbage".

Even if the evidence for a high correlation between special abilities and language function seems consistent, this approach for the assessment

of language disorders has been questioned. Rees (1981) in an examination of the influence of auditory processing factors on language function and learning disabilities reaches the conclusion that this approach "fails to provide an acceptable explanatory model and suffers from internal inconsistencies with respect to experimental findings and logical argument". And she quotes several studies of children who got low scores on tests of central auditory function even if their speech and learning abilities were within normal limits.

Bloom and Lahey (1978) criticize that the special abilities may not be distinct from one another in language learning, that they do not seem to be prerequisite for language learning and that they may not generally be improved by remedial programs. Most important, they find no evidence that the remedial programs designed to remediate these abilities improve general language function. On the other hand, the emphasis on special abilities has had a beneficial influence on the strategies of language intervention. It has generated more realistic approaches to solve the problems, but its potency to explain their causes and to set the goals of treatment seems questionable.

Language orientated aspects.

The great majority of children with speech impairments - 70 % of the children seen at the phoniatric department in Malmö - do not show any other defects. Their problem is essentially one of deficient language processing. As a rule, signs of impaired language are found also in the children with overt motor or sensory deficiencies: dysarthric or hearing impaired children with defective speech but normal language count to the exceptions. Only in cases of cleft palate quite a number

of children but far from all seem to develop language normally in spite of their defective articulators and aberrant speech.

Early approaches to assess child language settled out from rather superficial criteria like counting the number of words per minute, mean sentence length, or percentage of nouns, verbs, etc., out ot the total number of words. Comprehensive assessments of child language should take into account phonologic, morphologic, syntactic and semantic components of language.

As to the development of s e m a n t i c relations in children, information is still insufficient. Different aspects of the children´s vocabulary can, however, be assessed. In tests of word recognition, the child is asked to respond to a spoken word by choosing the correct picture out of three or four. In tests of recall, the child has to define test words spoken by the examiner, and finally naming tests can be used. A general clinical impression is that the extent of a child´s vocabulary depends more on environmental factors than other components of language function.

Children´s s y n t a c t i c abilities may be assessed by sentence completion and sentence imitation tests. The child´s knowledge of grammatical morphemes, word order, and phrase structure may also be assessed from systematical analyses of his spontaneous language.

The assessment of children´s p h o n o l o g y traditionally has attracted the greatest interest of speech clinicians, partly because a deviant pronunciation seems to be the most conspicuous factor of language delay, detrimental to intelligibility, partly because many children do not seem to have any problems with "language proper" but

for "articulation errors" as the terminology was in mainly phonetically orientated circles. The diagnostic label of "dyslalia" was attached to children belonging to this later group, possibly qualified by an "-ism" attached to the Greek letter indicating the mispronounced sound, like "sigmatism, rhotacism", etc.

The traditional method to assess phonology is the "articulation test", where the child in response to pictures is expected to utter words which include the tested "sounds" (phonemes) in either initial, medial or final position. Mostly only the consonants are tested, but a number of consonant clusters is generally included in the tests. Some tests can be criticized because of test words not included in the children´s vocabulary or because of words where the realization of the phoneme might be affected by the phonetic context. A great disadvantage is that the realization of each phoneme is tested so few times, sometimes just once, and the test therefore may not be representative of the child´s spontaneous performance in speech.

The articulation tests may be scored just by counting the number of errors, or the errors may be described in terms of omissions, substitutions, distortions, and transpositions. Methods of remediation within this model highly emphasize on the mechanics of articulatory movements.

Linguistically based studies offer a different approach, placing the "speech errors" into a phonological context and showing their systematicity. One method is feature analysis of the child´s phoneme inventory, which as a rule reveals a pattern of errors on the same feature across different phonemes. Deviant phonology can be described

as a set of deviant phonological rules, such as the one noted by Compton (1976): fronting of velars, stopping of fricatives and affricates, cluster reduction, omission of final consonants, context-sensitive voicing, labialization of /r/, etc. Grunwell (1981) after an informative survey of the pertinent literature compares three different frameworks of analysis: correspondence analysis, and the analysis of developmental processes on the one hand, both basically representing a comparison between the norm of adult phonology and the deviant realizations by the child. And on the other hand the organization of data as an independent phonological system in its own right to be compared with universal and characteristic properties of normal phonologies. Only this latter kind of analysis reveals the organization of the children´s phonological systems to be deviant, as they violate criteria of systematicity and include asymmetrical and uneconomical sets of contrast. They are extremely restricted in their organization and highly variable in their operation. From a pure linguistic point of view they are pathological, as they cannot adequately realize the language in the spoken medium.

From the approach of phonological analysis just described, Grunwell infers the following principles for planning remediation, namely to treat entire phonological patterns first focussing on most deviant and most "destructive" patterns with regard to the communicative efficiency, and to make efforts to eradicate variability. Furthermore, the normal developmental sequence should be followed and each case should be addressed individually.

Practical aspects on the assessment. Concluding remarks.

The complexity of the diagnostics of speech retarded children should be evident so far. Because of restrictions in their profile of

professional training, most examiners will find the diagnostic work too demanding to be performed in every aspect by themselves. An obvious solution is teamwork, or at least a close cooperation between a physician and a linguistically orientated speech therapist. However, this may be difficult to organize. Furthermore, some parents of language delayed children may have difficulties in placing confidence in more than one examiner at a time.

The examiner should be perfectly aware of the aim of his assessment and the shift of emphasis between diagnostics for the initial clarification and diagnostics as a basis for therapeutic intervention. The questions to be asked initially are: Is there any problem? and if so, Can it be defined on the basis of information from the first assessment or are additional investigations necessary? Next question is What should be done? The answer to this might imply knowledge of organization and decisions of placement. For instance, children with retarded speech who function below age level also in cognitive, sensory and motor skills probably will not benefit from specific language remediation only, but need special educational placement. Diagnostics as a basis for remediation has to focus more on the kind and extent of the deficiency. Quantifiable scores from formal tests may be felt necessary to measure the results of therapy, but language testing seems to be beyond the scope of this paper and reference is made to textbooks like Bloom and Lahey (op.cit.).

Whether at the initial assessment or during remediation, a careful description of the child's behaviour is more important than to seek to fit the child into diagnostic categories such as etiological syndromes or test scores. It is the responsibility of the examiner to organize the setting to be relaxed and calm, allowing the child sufficient time

to resolve his anxieties and to get acquainted with the entire situation. Sometimes, a sufficient contact to the child can be established first during the training sessions, and it might be wise to start with "diagnostic therapy" to get a realistic assessment of the child´s language abilities.

Concluding, the author has consciously refrained from referring to the qualification "simple" in the title, as it seems questionable if a speech retardation of such an extent as to really qualify for the expression ever can be simple. The ability to communicate by speech, being a most central quality of human existence, any impairment in this respect must be considered all but a simple problem to the individual. And so every child with deficient development of his speech should be awarded a thorough diagnostic assessment as an individual case on its own merits.

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