Chapter 10: Development and disorders of language

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Language can perhaps be most simply defined as the capacity to generate and transmit symbolic or coded communication (Sheridan, 1961). Although demonstrable in some other mammals, language appears to be only well developed as a facet of human behaviour.

Linguistic symbols or codes can be words used in speech or in writing or some other forms of signing, for example those used by the deaf. Their fundamental characteristic is that particular symbols consistently represent particular concepts whether these are concrete objects or abstract ideas.

It is useful to regard language as having three functional components: first as a tool for thinking, most commonly termed 'inner language'; second as a capacity for understanding others; and third as an instrument for expressing thoughts. The development of inner language implies that the individual has acquired an internal store of coded concepts that can readily be drawn upon in cognitive processes. It is elegantly illustrated in children by their symbolic play, for example how they use miniature toys such as dolls' house furniture as representative of the real thing. In an activity such as this, and without necessarily a word being uttered, children by their complex and imaginative play indicate that they can both understand and systematically apply the principles of using symbols in thought.

The ability of children to understand others' language, that is their comprehension, emerges in parallel with their inner language and clearly each reinforces the other. Both comprehension and inner language are more fundamental to cognitive and linguistic competence than is the expressive function of language and perhaps as a result they normally develop considerably ahead of children's expressive abilities. Nevertheless, it is the way that children communicate with others that most readily brings them to attention or is a cause of concern to their parents. It is not surprising, therefore, that at a lay level 'speech' and 'language' are terms that are used interchangeably.

However, the term 'expressive language' implies both the capacity to organize one's thoughts prior to expressing them, that is an encoding function, well illustrated by the task of preparing in one's mind a sentence in a foreign language, and also the motor functions involved in communication, best exemplified by the word and sound production of speech. Speech can be regarded, therefore, as the capacity and ability to express verbal symbols and is largely a motor function. Its development and disorders are considered in detail elsewhere in this volume (see Chapter 11).

The development of language

The newborn infant has a remarkable social competence both in reacting to and initiating contacts with adults. These behaviours include a variety of facial expressions, cries and other sounds and the ability to take turns with an adult in interactive situations. Although such behaviours are not truly linguistic within the context of the definitions given above as symbolic communication is not being used, they nevertheless indicate that social interaction is an innate human ability.
Linguistic competence is built onto this social behaviour. Although it has been postulated that inherent within the brain is a language acquisition device, this is best regarded not as a localizable anatomical region within one or both temporal lobes, but more as an indication that the acquisition of language is inherently determined as a cerebral cortical function with the details of an individual's subsequent performance being then shaped by environmental experiences.

In the first year, children demonstrate little in the way of symbolic performance. Instead they show situational understanding, for example by appropriate excitement or distress in particular circumstances. At the same time, their expressive abilities are limited to a multisyllable babble and, in spite of the optimistic interpretation of parents and the obvious foundations of prosody (speech rhythms) in babble, clear words to not normally emerge at this stage.

Genuine symbolic skills emerge during the second year. Verbal comprehension increases from an ability to cope with single concepts, for example, 'where are your shoes?' at 12 months to two linked items at 24 months, for example 'put the cup on the table'. Inner language can be demonstrated in play with toys but is still immature and most play at this age is constructive rather than symbolic or imaginative. The rate of development of expressive abilities at this age is enormously variable with girls usually being so considerably in advance of boys that different age norms for the relevant standardized tests are used (Reynell, 1977). It is nevertheless customary to expect children to have two word utterances by the time they are 2 years old, the corollary being that any child who by this age has no clear words must be referred for further evaluation.

Between 2 and 5 years of age comprehension extends progressively to include complex sentences involving abstract concepts and the various parts of speech. Inner language can be demonstrated in detailed imaginative play and expressive abilities are such that by age 5, most parts of speech are normally used and articulation is clear.

Beyond 5 years of age the further development of linguistic skills is seen in such diverse ways as reading and writing, the understanding of grammatical rules and the use of language in problem solving. Language at this stage is very much an integral part of higher cognitive functioning.

Factors influencing language development

Cerebral functioning

As has already been discussed, children have an innate capacity to acquire and use language. It follows that any abnormality of the brain, whether this is a developmental anomaly or a disorder acquired pre-, peri- or postnatally, can delay or retard linguistic competence specifically or as part of a more generalized neurological disorder such as is seen in global developmental retardation.
Sensory experiences

Consistently normal hearing is a prerequisite for normal language development and the effects of hearing loss on language are considered presently. In addition, however, the ability to see is obviously of great importance in, for example, associating objects with their labels. Visually impaired children commonly have significant language problems.

Emotional status

Given the social functions of language, it is not surprising that behavioural or emotional disorders that lead to some failure of adaptation of a child are frequently reflected in delayed or deviant linguistic function.

Environmental experiences

To communicate normally, children need both appropriate linguistic experiences to stimulate development and also the opportunity to express themselves. Environmental deprivation is a potent cause, therefore, of developmental and linguistic delay.

Disorders of speech and language

Speech and language disorders are not specific disease entities. Instead, when a child's speech or language deviates sufficiently far from that which is conventional and acceptable for a child of similar age and causes over communication, intelligibility or social adaptation difficulties or alternatively parental concern, then it might reasonably be considered that he/she has a significant functional disorder of speech or language.

Incidence

Both the pattern and severity of communication disorders vary with children's age and state of language development. As a result, prevalence studies in populations have used different criteria for assessment and have been difficult to compare. As an approximate indication of the size of the problem, however, some 4% of 4 year olds have sufficient difficulty, for whatever reason, with their intelligibility to bring them to notice (Morley, 1965). About one in a 100 children have more severe, long-standing or refractory communication disorders.

Causes

At a broad level these are abnormalities of the factors listed above that influence normal language development:

1. neurological abnormalities - either developmental or acquired
2. sensory impairments of hearing or vision
3. emotional disorders
4. environmental deprivation.
Unfortunately specific language abnormality syndromes correlate poorly with their underlying causes even when these are definitely known. Frequently, also, the cause of a language problem has to be assumed or considered as unknown even after relevant investigations. This is especially so for what have been termed 'developmental language disorders'. Moreover, it is more likely that the problems of individual children will have multiple causes.

It follows, therefore, that aetiological considerations are relatively minor when language disorders are classified and when analysis is made of specific clinical problems.

**Classification (Bishop and Rosenbloom, 1986)**

Historically, medical classifications based on a mixture of aetiological and clinical considerations and linguistic classifications have competed. It is probably best, however, to combine medical and linguistic criteria and Table 10.1 summarizes this approach.

It can be seen in Table 10.1 that individually identifiable disorders of language have both linguistic and medical parameters and, far from competing, both are necessary for a full description of the disorder. In the following discussion, each of the conditions identified in Table 10.1 are considered by taking each of the vertical columns in turn.

**Defects of speech apparatus**

These include congenital structural abnormalities, for example cleft palate, and neuromotor disorders, as shown in suprabulbar palsy. 'Dysarthria' refers to speech problems associated with weakness, spasticity or incoordination of the speech musculature and 'dysphonia' to abnormalities of voice control. Defective speech sound production can also occur in the absence of obvious physical handicap. Investigation in such cases may provide evidence of minor physical problems of oromotor control, for example a history of feeding difficulty or drooling. It is important also to examine oral sensory skills (Martin, 1981).

When children present with speech disorders, it is important to recall that language disorders can coexist especially in children with cerebral palsy or those with cleft palate with an associated hearing loss.

**Hearing loss**

**Sensorineural deafness**

When this is acquired after language has fully developed, there may be comprehension difficulty and voice and articulation deterioration but little effect on linguistic skills. By contrast, deafness that is congenital or acquired prelingually has profound consequences even after early diagnosis and amplification. The majority of deaf children have limited or abnormal speech and frequently their problems extend to writing and signing which are also limited in linguistic terms. Given the controversies that exist about how best to teach language to deaf children, it is disappointing that there is no research evidence to support either the concept that signing interferes with speech acquisition or that it fosters it (Bishop, 1983).
Selective high frequency hearing loss can also seriously affect language development and is often missed, children being considered to have a developmental dysphasia. The voice quality in affected individuals is not characteristically ‘deaf’.

**Conductive loss**

It is likely, although conclusive evidence is lacking, that children who sustain several episodes of otitis media in the preschool years are at risk of language disorder with poor listening skills, phonological problems and persistent educational handicaps.

**Congenital brain damage or dysfunction**

Sparks (1984) has recently reviewed the many patterns of speech and language disorder resulting from a variety of birth defects and, although slow speech development may be the first indication of developmental disorder, fuller assessment quickly reveals more pervasive problems. Medical investigation in such circumstances is often unrewarding, even when a disciplined approach using modern investigative methods is used. Nevertheless, a search for an underlying cause in an attempt to demonstrate the site and nature of the lesion, to suggest treatment and to indicate a prognosis are prerequisites for helping affected children and their families.

In mentally retarded children, language tends to be delayed in proportion to their intellectual difficulties rather than to be deviant, but norms for what is appropriate language in this group have never really been defined.

**Chromosomal disorders**

In Down's syndrome (trisomy 21), the most common chromosomal disorder, language is frequently disproportionately impaired so that verbal attainments are poor even when compared to other children of similar non-verbal ability. It is likely that a higher incidence of conductive hearing loss and specific motor disorders of speech are contributory factors to this situation.

More generally there appears to be an increased incidence of language disorders in children with chromosomal problems (Friedrich et al, 1982) and this includes boys with the sex-linked variety of mental retardation (the fragile X syndrome).

**Hydrocephalus and the cocktail party syndrome (Hadenius et al, 1962)**

Some hydrocephalic children of low intelligence seem to have disproportionately good language. However, although they have a sophisticated vocabulary, there is poor content to what they say and formal testing reveals poor comprehension.

**Infantile autism**

Here there is a major cognitive disturbance characterized by marked impairment in the development of social relationships, many and varied obsessional characteristics and a constellation of linguistic abnormalities ranging at their most severe from mutism through
poor comprehension to abnormal speech, for example pronoun reversal. Detailed analysis of the language of autistic children demonstrates impairment for all modalities including gesture and other forms of signing.

The ultimate ability of autistic children to live independently is determined primarily by their intellectual limitations. For those who are autistic, but less severely mentally handicapped, and these are the minority, language acquisition can lead to a superficial competence although problems with social and personal relationships remain.

**Acquired brain damage or dysfunction**

The effects of localized brain lesions on language are very different for children and adults. In the adult, damage to circumscribed areas of the left hemisphere is associated with dysphasia and there is a close relationship between the locus of injury and the type of language problem. In children the effects of similar lesions depend on age. In infants, left hemisphere lesions typically depress general intelligence without causing dysphasia. This reflects the immature brain's plasticity of function which enables language to develop in the right hemisphere following early left-sided damage. Persistent dysphasia may, however, be found after bilateral lesion in infancy.

When left hemispheric lesions are acquired after a child has learned to speak, language impairment frequently develops resulting in word finding and phonological problems rather than the typical features of adult dysphasia.

**Acquired aphasia with convulsive disorder - Landau-Kleffner syndrome**

Rarely, previously normal children acquire very severe language comprehension problems in association with epilepsy (Landau and Kleffner, 1957). Affected children develop normal language for their first 4-8 years but then regress either suddenly or over a period of weeks or months. The vast majority have convulsions around the time of onset of their aphasia; the remainder have abnormal electroencephalograms with seizure discharge, usually from both temporal lobes. Some affected children recover fully, others continue with language problems which may fluctuate and a few remain subject to epilepsy. Conventional tests of hearing including evoked response audiometry in children with this disorder, show no abnormality; however, a central (cortical) auditory origin is postulated because the children respond best to language presented in a visual modality and also some individuals do appear to have abnormal auditory adaptation to cortical auditory evoked responses with frequency modulated stimuli.

**Degenerative disorders**

Speech and language can be lost progressively as part of the more generalized loss of psychosocial skills that is seen in a variety of degenerative brain disorders. The causes, clinical features and differential diagnosis of these uncommon conditions are described by Rosenbloom (1981). Deterioration is often slow. As with other disorders in which cognitive functions are globally impaired, retardation of linguistic progress may be the first indication that anything is wrong. More comprehensive assessment then indicates the widespread range of disabilities.
Unusually a severe form of acquired autistic behaviour with loss of language, social isolation and obsessional characteristics can be the presenting feature of degenerative brain disorders in childhood.

**Emotional and behavioural disorders**

Emotional disorders may make children reluctant to communicate. However, when there are no or few other signs of psychological disturbance, emotional and behavioural disorders are an implausible explanation for delayed language acquisition and great care is needed in assuming this aetiology in individual cases.

**Elective mutism**

This term is used to describe children who refuse to speak in all but a few situations and appear excessively shy. A significant proportion of electively mute children also have articulatory or language defects. In such cases reticence may be an understandable reaction to being teased, criticized or not understood. Others can speak normally but fail to do so. Such individuals do not have a language disorder but they may have other feature of psychiatric disability.

**Environmental deprivation**

Environmental deprivation can be due to physical factors, for example poverty, malnutrition and poor housing, or to social factors, for example a lack of caring relationship between children and their caretakers or inadequate linguistic stimulation. When severe, both forms of deprivation tend to occur at the same time and, in such circumstances, children do show global developmental delay but with particular impairment linguistically. Similar findings have been demonstrated in institutionalized children suggesting that, even when children's physical needs are reasonably catered for, severe and continuing social deprivation in itself can adversely affect the development of language.

In less extreme situations, however, there is no evidence that children of working class mothers have significantly depressed linguistic attainments when compared with middle class children (Tizard et al, 1983). It has also been demonstrated that placing children in a day nursery may well be counterproductive from the language development viewpoint for the vast majority of children who have conventional rearing experiences.

**Unknown aetiology - developmental language disorders**

Many children present with language disorders for which there is no obvious explanation. Peripheral hearing is normal, non-verbal intelligence is good, the family home adequate and there is no sign of genetic, physical or psychiatric abnormality. These can be termed for the time being the 'developmental language disorders', although it is reasonable to assume that in due course their specific causation will become clearer.
**Stuttering**

Here speech is dysfluent and individual words are disrupted by syllable or sound repetition or sound prolongation. Stuttering is more common in boys than girls and tends to run in families. It is presumed that both genetic and environmental factors contribute to its presentation in individual children. Most young children go through a period of dysfluency as they learn language and parental anxiety may exacerbate or prolong the problem. Specific and direct help to affected children from speech therapists is usually best delayed, however, until children themselves are aware of their having a significant problem.

**Delayed language acquisition**

This term is often used loosely about any language difficulty; however, it should really be reserved for those children whose overall development is normal but whose language development progresses at a slow rate with essentially normal language nevertheless appearing by the age of about 6 years. This development pattern can be regarded as a normal biological variant rather than evidence of a neurodevelopmental disorder.

The problem for clinicians in such cases is how to distinguish language delay and language disorder in practice. One clue to outcome is the severity of the problem especially if it is monitored over a period of time. As a rule of thumb, there should be cause for concern if a child has only a handful of words at 3 years, speaks in single words at 3.5 years or in two word utterances at 4 years.

It may also be that the pattern of a child's immature language can also give a guide to the prognosis. Thus, those who have a phonological system resembling that of younger normal children are likely to have a better outcome than those with deviant characteristics.

**Phonological syntactic syndrome (Rapin and Allen, 1983)**

This is the most common variety of developmental language disorder in which otherwise normal children have selective difficulties with language form but have normal language content. There is a normal urge to communicate and sensible and appropriate things are said but in a phonologically inappropriate or unintelligible way. There is a wide range of severity in this disorder ranging from total unintelligibility to relatively minor deviations in individual children's sound systems.

Parents typically report slow language development from birth and there is often a positive family history of language or reading difficulties. Boys are two to three times more likely to be affected than girls. In addition to their phonological problems, affected children may also have oromotor dysfunction including a history of difficulty in swallowing, sucking or chewing.

As time proceeds, there is usually slow resolution of this disorder, but not infrequently children are significantly behind in their basic school attainments and social adjustment by the time that reasonable expressive language is acquired.
**Semantic pragmatic disorder**

In this condition, children have difficulty in using language as a social tool. As a result they demonstrate a literal and rigid use of language, have major comprehension difficulties, for example of abstract concepts, and have problems in initiating and maintaining social contacts and understanding the rules of social behaviour. As a result, many become socially isolated. The term to describe such children was first used by Rapin and Allen (1983). In their mildest forms semantic and pragmatic problems, especially in older children, may be subtle and difficult to distinguish from normality, but detailed language testing reveals comprehensive problems. More severely affected children clearly overlap those who can be labelled as autistic. Social skill training programmes rather than conventional language therapy appears to effect improvement in individuals with this disorder.

**Congenital auditory imperception**

Very rarely indeed, children appear to be born with normal peripheral hearing but an inability to make sense of spoken language. Affected individuals make very slow linguistic progress and frequently have to be provided in due course with alternative communication systems, for example with signing. It may very well be that affected children have a defect in auditory cortical functioning but the methodology to confirm this is not yet available.

**Assessment and management of childhood language disorders**

In promoting children’s optimal functioning it is reasonable to surmise that early detection, full assessment, relevant treatment programmes and appropriate advice to parents contribute significantly.

Screening programmes for developmental abnormalities in childhood include linguistic items and it is appropriate that language be seen in the context of overall child development, rather than that abnormalities of language should be separately sought. Similarly, when children are found to have developmental problems and are referred for comprehensive assessment evaluation, their linguistic functioning needs to be set within this context if only because of the interaction that exists between linguistic and other developmental parameters. It cannot be emphasized too strongly, however, that accurate and detailed evaluation of auditory functioning in children who present with developmental or linguistic delay is fundamental.

When, following comprehensive assessment, children are found to have language disorders, the detailed analysis needs to be multidisciplinary and based on the children’s perceived developmental and educational needs. Full description of therapy and educational programmes for language disordered children is beyond the remit of this discussion. The points can nevertheless be made that not only do relevant therapy and educational resources need to be made available for language disordered children but also that their parents need appropriate counselling and advice.
Table 10.1 Medical and linguistic classification of language disorders

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<th>Patterns of language impairment</th>
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<td><strong>Defects of speech apparatus</strong></td>
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<td><em>Hearing loss</em></td>
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<td><em>Pre- or perinatal brain damage or dysfunction</em></td>
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<td><em>Acquired brain damage or dysfunction</em></td>
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<td><em>Emotional or behavioural disorder</em></td>
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<td><em>Environmental deprivation</em></td>
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<td><em>Unknown aetiology: developmental language disorder</em></td>
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<td>Abnormal speech</td>
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<td>Dysphonia</td>
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<td>Dysarthria</td>
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<td>Elective mutism</td>
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<td>Chronic conductive hearing loss</td>
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<td>Left hemisphere lesions</td>
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<td>Phonological syntactic syndrome</td>
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<td>Semantic or pragmatic problems</td>
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<td>Cocktail party syndrome</td>
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<td>Semantic pragmatic disorder</td>
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<td>Poor comprehension and limited expression</td>
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<td>Prelingual deafness</td>
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<td>Mental handicap</td>
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<td>Landau-Kleffner syndrome</td>
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<td>Congenital auditory imperception</td>
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<td>Severe non-verbal and verbal impairment</td>
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