

# Language and the mind

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## 1 Language and the mind

The study of language and the mind – *psycholinguistics* – is concerned first and foremost with the acquisition of language. This can mean both the acquisition of one's mother tongue natively and that of a foreign language as an adult. In this area one is interested in the stages of acquisition and in seeing how they are structured. A related area within psycholinguistics is that of language and the brain (often called *neurolinguistics*), especially concerning disturbances which may arise from disease or an accident. Language pathology is a discipline with common ground between linguistics and medicine. But it goes beyond this and the insights gained here contribute to the understanding of language as a whole.

### 1.1 First language acquisition

The acquisition of one's native language is probably the most remarkable feat which one performs in early childhood. This process is part of one's general

cognitive maturation which lasts several years after birth. Humans have a relatively long childhood, when compared to higher primates, and it has often been speculated that in the development of the human species childhood was extended to accommodate the acquisition of a complex language system.

Despite the long human childhood the acquisition of language is remarkably fast. Childhood lasts until puberty – somewhere between 11 and 13 years of age – but structural knowledge about language is actually acquired in less than half this time. By the age of 6 the child has acquired mastery over all the closed classes of his/her native language, i.e. the phonological, morphological and syntactic system. This fact is all the more extraordinary given the poverty of linguistic input and the fact that children receive little or no guidance in language acquisition from those around them.

By ‘poverty of linguistic input’ one means the unstructured and fragmentary language which children are exposed to. Even those children for whom this is true to an extreme extent, e.g. children in homes or orphanages, still acquire their native language as satisfactorily as those who grow up in an intact family. In contradistinction to second language learning, children are not first presented with very simple sentences, progressing gradually to more difficult ones.

What such observations would seem to imply is that language acquisition proceeds on the basis of pre-defined steps which are determined by innate knowledge about language, this knowledge informing the children about how to manage and structure the information which they pick up about the language in their immediate environment. Another important observation supports this thesis: children correct themselves, given time. For instance, if children start off by treating all verbs as weak and say things like *singed*, *taked*, *goed* they will nonetheless arrive at the correct forms of their own accord when enough time is allowed.

The role of caretakers, above all the mother, has led some researchers to assume that their speech – often termed *motherese*, a deliberately simplified form of the adult language – is important for the child’s acquisition of language. Opinions are still very much divided on this point and the evidence of neglected children who acquire language normally would point away from any importance of motherese, despite its obvious value as evidence of the mother’s affection for and concern with the child.

**Language transmission** Language is obviously passed on from parents to their children. But on closer inspection one notices that it is the performance (language in use) of the previous generation which is used as the basis for the competence (abstract knowledge of language) of the next. To put it simply, children do not have access to the competence of their parents.

- 1) Linguistic input from parents (performance) →
- 2) Abstraction of structures by children →
- 3) Internalisation of these (competence of the present generation)

The above model is the only one which can account for why children can later produce sentences which they have never heard before: children store the sentence structures of their native language and have a lexicon of words as well. When producing new sentences, they use the internalised structures and the vocabulary they have built up for themselves. This process allows children to produce a theoretically unlimited number of sentences in their later lives.

Language acquisition for any generation of children consists of achieving mastery in four main areas, i.e. acquiring:

- 1) A set of syntactic rules which specify how sentences are constructed from phrases and phrases out of words.
- 2) A set of morphological rules which specify how words are constructed from morphemes, i.e. grammatical units smaller than the word.
- 3) A set of phonological rules which specify how words, phrases and sentences are pronounced.
- 4) A set of semantic rules which specify how words, phrases and sentences are interpreted, i.e. what their meaning is.

Certain shifts may occur if children make incorrect conclusions about the structure of the language on the basis of what they hear. Then there is a discrepancy between the competence of their parents and that which they construct; this is an important source of language change.

## **1.2 Definitions and distinctions**

*First language acquisition* The acquisition of the mother tongue is carried out in the first years of childhood in a sequence of relatively clear stages (see below) and leads to unconscious knowledge of one's native language which is practically indelible. Intelligence has no direct bearing on acquisition, i.e. children of different degrees of intelligence all go through the same process of acquiring their native language, although individuals can and do differ in their mastery of open classes such as vocabulary. Language acquisition can be compared to other instincts such as that to walk, to use one's hands or to develop telescopic vision or binaural hearing.

*Bi- and multilingualism* This is the acquisition of two or more languages from birth or at least together in early childhood. The ideal situation where all languages are equally represented in the child's surroundings and where the child has an impartial relationship to each is hard to find in reality so that of two or more languages one is bound to be dominant.

*Second language acquisition* This is the acquisition of a further language after the mother tongue has been acquired. If the process begins after puberty, then it is often called ‘learning’ – a conscious process – to distinguish it from ‘acquisition’ which is largely unconscious. Learning after puberty is characterised by imperfection and the likelihood of being forgotten. It leads to largely conscious knowledge. Sometimes the process is called *further language acquisition*.

*Error* This is an incorrect feature in language acquisition which occurs because of the stage at which the child is at a given time (acquisition is as yet incomplete). Errors are regular and easily explainable. For instance, the use of weak verb forms for strong ones, e.g. *singed* for *sung*, or the overapplication of the *s*-plural to all nouns in English, e.g. *foots/feets* for *feet*, would be examples of errors. Such features right themselves with time when the child appreciates that many word classes contain a degree of irregularity.

*Mistake* Here one is dealing with a random, non-systemic and usually unpredictable phenomenon in second language learning. Mistakes are sometimes termed ‘performance errors’ to emphasise that they arise on the spur of the moment when speaking and are not indicative of any acquisitional stage.

*Competence* is the abstract ability to speak a language, i.e. knowledge of a language independent of its use. It is constructed during early childhood by combining innate knowledge of language in general with actual linguistic input from the child’s surroundings.

*Performance* is actual use of language. Its features do not necessarily reflect the speaker’s language competence. For example, when one is nervous, tired or drunk one may have difficulties speaking coherently. This, however, does not mean that one cannot speak one’s native language.

### 1.3 Conditions of acquisition

*Natural language acquisition* This is characterised by continuous exposure to language data. This data is not ordered, i.e. children are exposed to the performance of adult speakers of the language they acquire. There is little if any feedback to children from others with regard to this intake.

Children are not corrected as often by their mothers/fathers as one might imagine. Self-correction is most common (but not immediate) due to two factors. Most broadly speaking, because of unsuccessful communication (here immediate correction may take place) and secondly by consistently hearing correct usage on the part of the mother/father, children eventually drop their incorrect forms, which while perhaps communicatively effective, are grammatically wrong. It is also true that children do not learn language just from the mother/father. If

siblings are present, they too form a source of input for the child. And siblings do not correct others or simplify their language for the younger ones among them.

*Controlled language acquisition* This is intervallic, if not to say sporadic. Furthermore, it takes place against the background of another language, usually the first language (L1) of the learners. In some cases, acquisition can be both natural and controlled, i.e. where one obtains formal instruction (or gives it one to oneself) and lives in an environment where the target language is spoken. Controlled acquisition is further characterised by an ordered exposure to the data of the language.

#### 1.4 Stages of language acquisition

Children pass through clear stages of acquisition in the first five or six years of their lives. Within each of these stages there are recognisable characteristics. For instance, up to the two-word stage only nouns and/or verbs occur. No children begin by using conjunctions or prepositions, although they will have heard these word classes in their environment. Another characteristic is *overextension*. Children always begin overextending, e.g. in the realm of semantics by using the word *dog* for all animals if the first animal they are confronted with is a dog. Or by calling all males *papa* or by using *spoon* for all items of cutlery. The conclusion one can draw from this behaviour is that children move from the general to the particular. To begin with their language is undifferentiated on all linguistic levels. With time they introduce more and more distinctions as they are repeatedly confronted with these from their surroundings. Increasing distinctions in language may well be linked to increasing cognitive development: the more discriminating the children's perception and understanding of the world, the more they will strive to reflect this in language.

##### *Stages of language acquisition*

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- |    |           |   |
|----|-----------|---|
| 0) | 0.0 – 0.3 | Organic sounds, crying, cooing  |
| 1) | 0.4 – 0.5 | Beginning of the babbling phase   |
| 2) | 0.10 – 1  | The first comprehensible words. After this follow one-word, two-word and many-word sentences. The one word stage is known as the holophrastic stage. Telegraphic speech refers to a type of speech with only nouns and verbs. |
| 3) | 2.6       | Inflection occurs, negation, interrogative and imperative sentences   |
| 4) | 3.0       | A vocabulary of about 1000 words has been attained  |
| 5) | 5 / 6     | The main syntactic rules have been acquired   |

These divisions of the early period of first language acquisition are approximate and vary from individual to individual. It has been noted that bilingual children

start speaking slightly later than their monolingual counterparts, most likely because they have to absorb information from two languages before beginning to reproduce this.

## 1.5 The acquisition of phonetics

The first sign of language one observes with children is a series of sounds which have no obvious meaning. This occurs in the so-called babbling stage which is characterised by sounds not necessarily part of the language the child is exposed to. After about six months the child begins to produce recognisable sounds from the language of his/her environment. These are the first steps on the way to acquiring a full phonological system. To classify infant sound utterances one can use the system of distinctive features which makes binary distinctions between types of sounds. The first distinction which the child acquires is that of [+vocalic] versus [-vocalic]. This can be seen in simple vowel utterances. The first consonant utterances concern those sounds which are articulated at the alveolar ridge or in front of it (so-called coronals), e.g. /ma/, /ba/, /da/. Of all the places of articulation the one which is most favoured by infants is the labial one. It is thus not surprising that the words for *mother* and *father* in child language start with a labial consonant in very many languages, typically *mamma* and *pappa*. The next distinction to be acquired by the child is that between nasal and non-nasal consonants, e.g. the distinction between /m/ and /b/. This is followed by the differentiation between voiced and voiceless consonants.

The relative chronology of phonological acquisition is related to the statistical frequency of segment types in languages. For example, vowels and nasal consonants are acquired first of all by children. Hence there is no language known without vowels or nasals (there may be one exception here: Salish a group of native American languages spoken on the United States/Canadian Pacific coast has reportedly no nasals). An acquisitional hierarchy for phonology would look something like the following:

- (1) vowels, glides
- (2) nasality
- (3) voice/voiceless consonants
- (4) place of articulation
  - a) labials and coronals (dentals, alveolars, palatals)
  - b) non-coronals (velars, uvulars, glottals)
- (5) manner of articulation
  - a) stops
  - b) fricatives
  - c) affricates

This list could be taken to be a list of statistical probability for certain segments across the world's languages. For example, there are virtually no languages without the first three types but there are many languages without affricates, e.g. Finnish. Seen diachronically, one finds that the less frequent elements tend to

disappear, thus French has lost affricates in its history (cf. the sound written *ch* as in *chambre* was formerly an affricate [tʃ] but is now a fricative [ʃ]).

Certain phonetic distinctions are acquired late (towards the end of the phonological acquisition period after 3 years of age). Two of these can be singled out and commented on. 1) the distinction between voiced and voiceless consonants word-finally and 2) the distinction between /l/ and /r/ after a stop (as in the words *clown* and *crown*).

The first of these is something which appears quite late in those languages which have the distinction. The consequence of this is that one would expect the distinction to be tenuous in the languages of the world. This is indeed the case. The voiced/voiceless distinction in word-final position is unknown in German and Russian (to mention only two eminent cases). It is avoided in Italian by ending words in a vowel, e.g. *fratello* ‘brother’, *cuore* ‘heart’, *sistema* ‘system’. In French the ‘Italian’ solution is to be found embryonically as all words with final voiced consonants are pronounced with a slight final schwa, e.g. *rouge* [ruʒ<sup>ə</sup>] ‘red’, *fraise* [frɛz<sup>ə</sup>] ‘strawberry’, *neuve* [nøv<sup>ə</sup>] ‘new’. One can explain the late appearance of this distinction with English-speaking children in ‘natural’ terms. The child has difficulty in perceiving and hence producing voiced sounds at the end of a word as here they tend to be voiceless because of assimilation to the cessation of articulation at the end of the word.

The second distinction, that between /l/ and /r/ after a stop, is difficult for children because it is not auditorily clear. The sounds of an /l/ and an /r/ in this position are too similar. As one might expect in change across languages one finds cases of interchange of /l/ and /r/. Thus one has Latin *perigrinus* ‘pilgrim’ and Italian *pelligrino*. In certain East Asian languages (such as Vietnamese, Thai and Chinese languages), and often in Irish, [l] and [r] are allophones of each other or have changed on being borrowed from one language into another, e.g. English *farm* /r/ but Irish *feilm* with /l/.

*Phonological processes* Apart from the acquisition of segments, child language is interesting from the point of view of phonological processes. By this is meant regular patterns of phonological behaviour. The processes in child language usually lead to a reduction in phonological form, i.e. to a simplification of the structure of words. Two of these processes are assimilation and cluster reduction. Assimilation can be seen where dissimilar consonants are rendered similar by the child, cf. /mo:mo/ for *motor*, /gog/ for *dog*. Many words from child language already exhibit this assimilation, e.g. *pappi*, *baby*, *lolly*, etc. Cluster reduction can be seen where two or more consonants in a word are reduced in number, cf. *sting* pronounced like *ting*, *clip* pronounced like *lip*, etc.

The above remarks refer to the child’s production of sounds. This does not mean that the child cannot perceive sounds in their adult form. In fact this discrepancy is called ‘the *fis*-phenomenon’ in acquisitional studies from the fact that a certain child, while hearing *fish* [fɪʃ], repeatedly produced *fis* [fɪs] as the pronunciation of *fish*, this being correct for him, seeing as how he had not

acquired the [ʃ] sound at the time of this observation. However, the child would not accept [fis] from an adult as a realisation of *fish*.

## 1.6 The acquisition of morphology

Any discussion of morphology must keep apart the two main subareas: inflectional and derivational morphology (see section ??? above). The first is concerned with such changes in form as are found with number and case (with nouns and pronouns) and tense and mood (with verbs). The changes of *man* to *men* and *sing* to *sung* are thus matters of inflectional morphology. The second subarea is concerned with the formation of one word class from another or one word class type from another. For example, the form *singer* is obviously derived from the verb *sing*, as is *actor* from *act*. These are cases of derivational morphology.

In the first area child language acquisition is characterised by *overextension* (see 1.4 above for remarks on semantics). This means that the child hears a certain inflection for a given word class, say *-s* in English as the plural marker of nouns, and uses this for all possible plurals although in adult English this is not permissible. The reason for overextension is that the child starts from the general and moves to the particular. To begin with he/she makes a hypothesis, in this case on the nature of plural formation in English. The ending he/she arrives at is that which is heard most frequently (the *-s* plural). In order to start with something, the child uses this ending for all cases of the plural. In the course of time the child's discernment of plural formation in English increases and the child learns to differentiate between various types. The final stage is that where the plurals are formed correctly.

One notable stage on the way to the adult system is where the child starts to produce the correct irregular plurals but mixed with the overextended regular plural suffix. This is responsible for formations such as *mens*, *teeths*, *feets*, etc. The type of plural formation which presents the child with greatest difficulty is the zero plural which one has in a very few words in English such as *fish*, *sheep*, *deer*. The child adds a suffix to these words until quite late (5 or 6 years). From the point of view of cognitive development this fact is of interest. One might imagine that for the child a zero plural formation would be the easiest thing to realise, after all the child does not have to care about an ending. However, this is not so. The child seems to expect that every grammatical category has a formal correlate, i.e. an ending. The idea of zero formation is apparently cognitively difficult for the child. Confirmation of this can be found in the acquisition of verbal morphology in English. There are a number of verbs in English which have past forms which are not distinguished from the present forms, e.g. *bet*, *cast*, etc. A frequent errors with children is to form the past on the regular pattern with these verbs, i.e. *betted*, *casted*.

In English derivational morphology this phenomenon is also to be observed. Agentive nouns are derived by suffixing *-er* as in *teach* : *teacher*.



This leads to overgeneralisation with forms like *cook* : *cooker* where the child believes the latter form to be the agentive noun derived from the verb *cook*.

One means of determining what state a child's acquisition of morphology is at, is to present the child with a series of nonsense words and demand various inflected or derivational forms. The advantage here is that one can be sure the child has not heard the forms before and is simply relying on the his/her unconscious construction of the morphological rule of the native language. Various tests of this kind have been done in the last few decades. The most notable deal with nominal morphology in English. Here it is possible to have (among regular plurals) the following types of endings: [s], [z], [ɪz]. These show a complementary distribution: the first only occurs at the end of words which end in a voiceless consonant, e.g. *cat* : *cats*, the second only after a voiced consonant, e.g. *dog* : *dogs* and the third only after a word itself ending in an alveolar fricative or palatal affricate, e.g. *horse* : *horses*; *witch* : *witches*. The nonsense words presented to children up to 3;6 years of age were, with the overwhelming majority, produced correctly. For instance, no children produced forms like /wʌgɪz/ for *wugs*. It would seem from this that the rules of allomorphy were learned quickly and completely by children even before the irregular plurals were acquired. The latter never had the function of serving as a model for the children. Thus when children were told that the plural of *ox* was *oxen* and learned to use it correctly they never used it as a model for forming the plural of *box* or *fox*, for example. From this one can conclude that children intuitively recognise that an inflectional form, which is quantitatively rare in a language, can never act as a model in forming the plural for new, unknown words.

The position with verbs is somewhat more complex. While it is true that weak verbs predominate in acquisition, as they do in English language history, the irregular verbs are subdivided. The dominant pattern here seems to be that of the verb with a change in stem vowel (technically called *ablaut*) as opposed to other irregular verbs. Thus one can sometimes find *brung* for *brought* (alongside *bringed*) on the basis of *sung* which has the same vowel in the infinitive. Some of these forms can survive into adult speech and if this happens across an entire community then they can become typical of a variety of English as has happened with *brung* in the Lower South of the United States.

## 1.7 The acquisition of syntax

The focus of attention here is on the increasing ability of children to produce complex sentences. How this ability arises and the stages of development which it shows have been the subject of intensive research by scholars, notably those involved in syntactic theories, such as generative grammar.

Before looking at details of the acquisition of syntax it is necessary to point out certain analytical difficulties. Children start with the so-called holophrastic stage in which a single word has the function of an entire sentence

in adult language. Later on they move to two, three, four and more word utterances. At each of these stages the forms they use are usually incomplete morphologically. In a sentence like *Mummy hum often* and without contextual information one cannot say whether this is a present tense sentence with the inflectional *-s* missing or a past tense one with the ending for the past (*-ed*) missing. In practical terms this means that the investigator is dependent on clues from the context in which sentences are uttered. A further difficulty lies in the interpretation of forms which children show. Say a child at some stage first uses the present continuous tense as in *Daddy working in his room*. The question which poses itself for the investigator is whether this already represents a productive use of the present continuous or whether it is mere imitation of a sentence heard on the part of the child. Only a large quantity of data can help here.

The acquisition of syntax becomes significant when the child starts producing complex sentences. A sentence is considered as complex when it shows coordination and/or embedding. These features can occur recursively in a sentence. To begin with the child forms simple paratactic sentences (consisting of coordinated clauses), and later on (after the age of 5) the child begins with hypotactic constructions (consisting of main and subordinate clauses).

Complex sentences arise after the child has started to produce many-word sentences. To begin with juxtaposition is used instead of co-ordination *You looked that book, I looked this book*. The first conjunction to be used is *and* with *and then* used in narrative structures; these begin to appear in the second half of the third year. Other types of complex sentence usually involve object complementation (see below). The reason for this probably lies in the commonness of verbs which take such complements such as *want, see, make, ask, need*, etc. as in *I want to go home. I need to eat my dinner* and similar sentences. Such sentences occur before those with indirect object complementation such as *I want you to go home, I'll make you give it to me*.

In the third year the child produces such complex sentences with verbs of cognition such as *think, know, forget*. After this type of complementation one is confronted with sentences with *wh*-adverbials or so-called place, manner and time adverbials: *Mummy showed me how he did it. He said when he came home*.

*Object complementation* This is a phenomenon whereby a sentence is embedded in another in the function of an object. To begin with such structures do not explicitly contain the subject of the embedded sentence, e.g. *I wanna read book*, which can be interpreted as 'I want you to read the book' and not just 'I want to read the book'. The next stage is the mention of the subject but with the verb in a non-inflected finite form: *I wanna you read the book* and finally with the infinitive as in adult language: *I want you to read the book*.

*'Wh' sentences and explicit relative clauses* Shortly after the acquisition of object complementation comes that of 'wh' words like *which, what, where*,

*when* in English. These words are soon to be found in embedded sentences, e.g. *I don't know who it is. Can I do it when we go home?* Soon afterwards the child starts using explicit relative clauses, that is with correct word order and the verb in the properly inflected form, e.g. *I show you the place I went. This is the way I did it.* To begin with, relative clauses are used with an introductory relative pronoun. Later on that is found but with some confusion between *what*, *which* and *that*: *I got everything what you got.*

*Temporal conjunctions* These seem to present the child with difficulties, for example the correct use of *before* and *after* is not acquired until after five. One should note here that the rate and order of development of the semantic notions expressed in language are fairly constant across languages so that the difficulties with *before* and *after* can be seen as resulting from the general cognitive development of the child. One aspect of this development is that the child interprets the linear order of sentence elements as being the same as the temporal order (this is termed the 'order of mention strategy'). This presents no problems in sentences such as *Fergal went into the garden and played ball.* But with a sentence like *Fiona went to bed after she had brushed her teeth* the child would seem to interpret this as 'Fiona went to bed and brushed her teeth'. The meaning of the sentence contradicts such an interpretation which results in the child avoiding such apparently nonsensical structures.

*Difficulties in sentence parsing* Among the various difficulties which the child encounters in syntactic analysis is the parsing of sentences which have differing subjects and objects on a surface and deeper level. With the sentence *Fiona is eager to see* the child has no parsing difficulties, *Fiona* is the surface and deep subject of the sentence; in *Fiona is easy to see* on the other hand, *Fiona* is the subject on the surface but the object in the deep structure which could be paraphrased as something like 'It is easy to see Fiona'. The differentiation of surface and deep structures where these conflict is something which is not acquired by children until quite late (between 6 and 9 years of age).

*Coordination* In this case two constituents are linked on an equal basis. Elements used to achieve such coordination are *and*, *but*, *or* or combinations of these such as *and then*, *or else*, *either...or*.

*Fergal and Fiona sang a song for the group.  
She ate her dinner but he left most of it behind.*

*Subordination* This is characterised by one sentence being embedded in another. The sentence into which another is embedded is termed the *matrix* sentence. Embedded sentences occur as various types, for instance as the complement of a verb or as a relative clause governed by a noun in the matrix sentence or as a temporal clause accompanying a verb.

*The fact [that he gave in] surprised me.*  
*The man [who arrived yesterday] is her former husband.*  
*She left [before we had time to speak to her].*

### 1.7.1 Parsing complex sentences

The types of complex sentences just discussed appear to run parallel to the cognitive development of the child. Once the child grasps the notion of time and tense cognitively he/she is in a position to reflect this in language. However, there are others types of sentences which are formally difficult for the child. In such cases the child has to grapple with the structure of syntax without any obvious help from cognitive processes. To illustrate what is meant by this consider the following cases of complex sentences.

*Minimal distance principle (MDP)* In their interpretation of complex sentences children would appear to understand that there is a close relationship between the subject of a verb in a complement clause and the nearest noun which precedes it in the matrix clause. Thus in the following sentences the minimal distance principle is adhered to as Fergal is the subject of the complement verb in each case.

*Fiona wanted Fergal to leave. Fiona wanted Fergal to come.*  
*Fiona told Fergal what to do.*

However, there is a set of verbs in English which violate this principle. *Promise* is a famous example. The verb *ask* may do so on occasions.

*Fiona promised Fergal to leave.*  
'Fiona promised that she, Fiona, would leave'  
*Fiona asked Fergal what to do.*  
'Fiona asked Fergal what she, Fiona should do'  
(contrast the MDP-compliant sentence *Fiona asked Fergal to sing*)

In these sentences it is Fiona who represents the subject of the non-finite verb complement. Now how do children deal with such sentences? In comprehension tests it has been shown that children overgeneralise the minimal distance principle and interpret a verb like *promise* as if it were like *tell*. The verb *ask* is understood in the indirect sense of the above sentence only at a later stage. The reason for this may be that children must learn that *ask* has two possible interpretations, whereas *promise* has only one.

*Relative clauses* The following sentences show four types of relative clauses in English with various combinations of subject and object. For the child acquiring the language the first type is the easiest to process as there is a linear sequence

of subjects, the cat in both cases. The sentences (2-4) where the relationships switch around present greater difficulty.

Subject Subject (SS) *The cat that bit the dog ate the rat.*  
Subject Object (SO) *The cat that the dog bit chased the rat.*  
Object Subject (OS) *The cat bit the dog that chased the rat.*  
Object Object (OO) *The cat bit the dog that the rat chased.*

*Causative sentences* These are sentences where the action of a verb causes a specific effect. A frequent feature of the acquisition of syntax is that an over-regularisation of such constructions takes place.

*The man opened the door.* (caused the door to become open)  
*The man cut the tree down.* (caused the tree to fall down)

*I'm just gonna fall this on her.* (drop it on her)  
*She came it over there.* (brought it over there)

*Inanimate subjects* Sentences with these types of subjects appear late in the acquisitional process, probably due to the child's assumption that subjects are animate by default.

*The wind broke the window. The chisel opened the door.*

All the examples discussed above raise the question whether cumulative parsing complexity dominates the acquisition of sentences. It is, however, not possible to show in all cases that there is a direct correlation between the time when a construction occurs in the acquisitional process and its relative syntactic complexity.

## 1.8 Linguistic theory and language acquisition

*The generative approach* Generative grammar has postulated from the beginning that children learn their native language by being exposed to the poor data of those surrounding them, mainly the parents and possible siblings. According to this view, the children construct their future competence in their native language out of the performance of others. The speed with which children acquire the language they are exposed to in their early years has led to the postulation of a so-called *language acquisition device* (LAD). Put in a nutshell, this is the innate predisposition of children to acquire language. The use of the general formulation 'to acquire language' is deliberate here because children will learn the language they are exposed to irrespective of what their parental linguistic background might be. This fact has implications for the possible nature of the LAD. It cannot contain specific information about individual languages, as

children can learn any (human) language. It can be imagined as a universal grammar which contains everything common to all languages and nothing specific to only some (see section ??? above). This is a strong claim but the generativists would say that the onus is on scholars of a different opinion to explain the extraordinary feat of acquisition which the child accomplishes in the first few years of life.

In recent generative theory the relationship of innate knowledge about language to specific features of individual languages has been expressed as that between principles and parameters. Principles are general organisational principles of all languages. Parameters are also general but have specific values in particular languages so that children fill in the values of parameters by being exposed to their later native language from birth onwards (see section above).

*Criticism of the generative standpoint* Dissenting voices were not long in coming forward as a reaction to the standpoint of the generativists. The following is a summary of the main criticisms. 1) The generativists did not work out the details of language acquisition. 2) They have continually revised their theory so that those practical scholars who wish to consider language acquisition within the framework of generativism are hampered by conflicting versions of the theory. 3) The acquisition of language does not take place in discrete stages as is implied by the generativists' notion of rule, i.e. one cannot say that one day a child does not have a rule (such as passivisation) and the next he/she does. 4) The input which the child receives from its surroundings is not as degenerate as the generativists would have us believe. On the contrary opponents maintain that it is filtered, ordered and tailored to the acquisitional needs of the child at a given stage. These criticisms, however, do not invalidate the notion of an innate language faculty and are unable to explain the speed and proficiency with which young children acquire their native language in less than optimal situations.

1) **Empiricism** This view of language acquisition stems from the school of psychology known as behaviourism which was put forward by American scholars such as B. F. Skinner in the mid 20th century. Behaviourism sees language acquisition as the result of children acquiring a number of linguistic habits by a process of trial and error. Children imitate their parents and are reinforced in their linguistic behaviour by successful communication. Thus in the early stages they are heavily dependent on kinesics (facial expression and bodily gestures used in non-verbal communication). Intonation is also important in early communication as it is in later life as well.

Children use various hypotheses to surmise what might lead to successful communication. Conditioning is obtained from their sociolinguistic environment and from this children make inductive generalisations.

2) **Nativism** This direction is chiefly associated with Noam Chomsky (see his review of Skinner's *Verbal Behavior* in *Language*, 1957) but is much older in

fact and goes back to Descartes' type of rationalism, as Chomsky himself readily acknowledges (see his *Cartesian Linguistics*, 1966). It criticises empiricism as not being able to answer a number of vital questions:

- a) why do children learn their native tongue so rapidly?
- b) why can children produce an unlimited number of sentences, among which are many which they have not heard before?

Generative grammar postulates a *language acquisition device* (LAD, see above) which is a universal and innate predisposition to acquiring language and which is part of the psychological constitution of all human beings. The LAD accounts for the ability of a child to learn any language if exposed to it in early childhood (i.e. not only that of his/her parents or surroundings).

The LAD is also the set of universals common to all languages. On being stimulated appropriately and adequately, the LAD leads to the acquisition of a (particular) language or languages. Its biogenetic preprogramming facilitates the internalisation of linguistic data and its codification in the form of rules. This in turn allows children to generate structures which they may not have heard before.

With language acquisition, the equation of structuralism with empiricism tends to be made with its opposite, i.e. that of nativism with generative grammar so that it is frequently assumed that those who support nativist views necessarily support generative views as well.

The debate between the nativist and empiricists can be seen in the wider context, beyond language, for instance in psychology or sociology. For this more general context, two other terms are often found, namely *nature* to refer to all that is innate and *nuture* to all that is acquired by experience in childhood.

### 1.8.1 *Tacit and explicit knowledge*

It is essential to grasp that not all knowledge is conscious (explicit). Given the ability of individuals to produce sentences in their own native language, one must assume that they have unconscious (tacit) knowledge of how the syntax of their language is organised. This knowledge can rarely be made conscious, indeed it is characteristic of so-called lay-speakers that they have many unfounded ideas about language, particularly their native tongue. And yet all native speakers can manipulate the syntactic structures of their language when forming sentences. The only answer to this seeming paradox is that speakers have unconscious knowledge about their native language. In linguistic terminology, this is called competence, the abstract knowledge about the structure of one's native language. The actual production of language is called performance.

The acquisition of language competence would appear to be a process of building and testing hypotheses. Some of these are right, some are wrong, the

latter are usually corrected in time. Thus a German child might say *singte* (because he/she imagines this is a weak verb) or might say *das Finsternis* 'darkness' for *die Finsternis* on the basis of words like *das Verhängnis* 'calamity'. The hypotheses which the child makes in the beginning nearly always move from the general to the particular, thus in the examples quoted, he/she treats all verbs as weak or all nouns, which show a certain phonological structure, as neuter, the refinement of this hypothesis coming later.

While admitting that language is rule-governed behaviour and that children progressively acquire rules which enable them to produce grammatically correct utterances, one cannot wholly equate the explicit grammars devised by linguists with the implicit mental ability (tacit knowledge) of the child. This equation is unfortunately unprovable. It is best regarded as a *metaphor* for the linguistic knowledge which the children have abstracted from their linguistic input.

### 1.8.2 *The logical problem of acquisition*

The following problem exists with regard to early language acquisition: it would seem impossible to learn anything about a certain language without first already knowing something about language in general. That is children must know what to expect in language before they can actually order the data they are presented with in their surroundings, extract structures from sentences and ascribe meanings to the words they encounter.

*The evidence of deaf children* Deaf children start by babbling and cooing but this soon peters out because they have no linguistic input. However, they would seem to seize on other communication systems and if people in their surroundings use sign language then they pick this up. The interesting point here is that the children usually learn the sign language more perfectly than the people from which they learn it (sign language has grammar comparable in principle to spoken language). Deaf children are creative in this language and create sentence structures if these are not present in their input. This would seem to suggest that deaf children use sign language as a medium for activating their innate knowledge about language.

*The evidence of pidgins and creoles* Children who have very poor input in their surroundings tend to be creative in their use of language. Grammatical categories which they unconsciously regard as necessary but which are not present in the input from their environment are then invented by the children. This has happened historically in those colonies of European powers where a generation was cut off from its natural linguistic background and only supplied with very poor unstructured English, Spanish, Dutch, etc. as input in childhood. Such input, known technically as a *pidgin*, was then expanded and restructured grammatically by the children of later generations and is known in linguistics as a *creole*. Here one can see that if the linguistic input from their environment is



deficient children create the structures which they feel are lacking, going on their own innate knowledge of language.

The implication of both the above cases is that children look for language and if they do not find it they create it somehow, so that they have a system of communication. In this sense language is a true instinct because it starts to develop of its own accord and does not need to be consciously triggered.

*Is there a language gene?* There is a pathological medical condition called *Specific Language Impairment* (abbreviated *SLI*) which covers a range of defects, all of which have in common that children continually make grammatical mistakes in their mother tongue, i.e. they would seem to be unaware of the existence of grammatical rules. The Canadian linguist Myrna Gopnik has shown in her study of a family in Britain that some 16 of 30 members suffered from the defect over three generations. This would seem to imply that it is genetically transferred (it looks like a defective gene which is dominant in the family) which would also imply that the ability to grasp the rules of grammar in first language acquisition is genetically encoded.

*Is the language faculty separate from other cognitive abilities?* There is one major piece of evidence that this is the case. *Williams syndrome* is a medical condition in which the patients are quite severely retarded, as both children and adults, and have difficulties counting properly or carrying out simple tasks like tying their shoelaces. However, such people are good speakers of their native language and just show a slight tendency to overgeneralise (they might say *speaked* for *spoke*). They have a good command of grammatical rules which shows that their language faculty is intact. The implication of this is that our ability to speak language is largely separate from other cognitive abilities.

### 1.8.3 *Language acquisition and language change*

It is a truism to say that language change has direct parallels to stages in first language acquisition. Many phenomena in language change have correlates in first language acquisition. Furthermore, features from stages of language acquisition can continue into adulthood and be adopted by the speech community as a whole. Arguments in support of this can be found quite readily. Take the history of English, for example. Various phenomena which are characteristic of stages of first language acquisition can be seen to have occurred throughout the development of the language as a whole. The following are some examples:

- 1) The misinterpretation of indefinite article + noun with initial vowel (technically known as *metanalysis*). This has occurred with both native English and Romance loanwords, e.g. *a nadder* → *an adder*; *a naperon* (from French) → *an apron*.

- 2) The replacement of strong verb forms by weak forms *dive : dove → dive : dived; shown → showed*. This is a general tendency with children in the early stages of language acquisition and is also an attested feature of English throughout its history.
- 3) The levelling of plural formation differences between Old English and Late Middle English. In Old English several plural types were available (much as in Modern German): *n*-plurals, umlaut-plurals, zero plurals and *s*-plurals. In the course of Middle English, however, these were drastically reduced in favour of *s*-plurals with *n*-plurals holding out the longest, e.g. *eyen* for *eyes*. Remnants of the former variety of plural formation are to be seen in the names of certain common animals and for parts of the body: *mouse : mice, goose : geese, tooth : teeth*. In early language acquisition children tend to form the plural by using one productive type and ignoring other options, e.g. *sheeps* for *sheep* (zero plural). This can be seen in formations like *feets, mens* (see acquisition of morphology above). The levelling of plurals can thus be seen as the survival of features of first language acquisition into adult language across a broad front. The plural *children* illustrates this particularly well: it is a double plural from *child + er → childer + en → childeren* (→ *children*). In all likelihood, the ending *-en* was added to *childer* after young speakers no longer regarded the latter form as a plural and added the then productive nasal suffix.

## 1.9 Second language acquisition

It is true to say that first language acquisition (FLA) research is largely concerned with describing the stages and characteristics of this acquisition with a view to understanding more about the nature of the human language faculty. On the other hand, the goal of second language acquisition (SLA) research is often to devise methods for improving the quality of target language proficiency. This fact results from the nature of SLA, a process which generally concerns adolescents and adults and which has a clear anchor in institutions such as schools, colleges and universities. The main features of SLA are seen to contrast with those of FLA.

*Features of (later) SLA which contrast with those of FLA*

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- 1) It happens against the background of the first language
- 2) It usually takes place after puberty
- 3) It has a large conscious component
- 4) It normally involves instruction in the target language
- 5) Its results are qualitatively inferior to those of FLA.

In the current discussion SLA during childhood, either parallel to FLA or just after it, will not be considered as this is a special hybrid case with its own specific manifestation. Instead, SLA after what is termed 'the critical period', i.e. that of puberty and just before, will be the subject of discussion. When this is the case, then SLA obviously takes place against the background of the learner's native language, 'L1'. As might be expected the structures already acquired for the first language will have an influence, often negative, on the performance of the learner in the target language, 'L2' (see 'interference' below).

Because SLA is a largely conscious process it involves an investment of effort and requires motivation on the part of L2 learners. These issues are irrelevant to FLA where the issues of effort and motivation do not arise.

Again as a consequence of the conscious nature of SLA additional factors play a role. It is easy to observe that certain individuals show a somewhat greater aptitude for language learning when compared to others. Aptitude varies among individuals much as do other abilities, such as those for sports, music, mathematics or whatever. With one's first language the question of aptitude does not arise, everyone learns a native language (assuming non-pathological circumstances for the individual and the acquisition environment) and reaches the level of competence which is typical for speakers of a language community.

In SLA the question of personality also plays a role. Again one can observe that some individuals are reserved and reticent and tend to hold back in L2 situations, something which often hinders their progress in proficiency. Others are extrovert and outgoing and speak readily, irrespective of their L2 competence. With one's first language, however, the nature of one's personality does not appear to be relevant to the degree of competence which one acquires.

### *1.9.1 The path to the target language*

Improving one's proficiency in a second language is by no means a linear matter with a gradual but steady improvement. An all too common phenomenon is what is called *backsliding*: people's competence appears to deteriorate rather than improve. There are many reasons for this. One may no longer have the degree of exposure to L2 which one once had or one's interest in the language may have waned. What backsliding shows is that one's hold on knowledge about L2 is nothing like as strong as that one has on L1.

Even if one does not suffer from backsliding, one can nonetheless show what is termed *fossilisation*. By this is meant that despite continuous exposure to L2 no improvement can be registered; one gets stuck on a certain level of proficiency. Reasons for fossilisation can be found in the lack of motivation to keep up the effort at a second language. By and large fossilisation can be said to occur when individuals attain a degree of communicative competence which lets them interact successfully with L1 speakers and hence the pressure to invest more effort into improving one's competence in this language is not present.

The path to proficiency in L2 is not always made easier by L1 speakers deliberately using what is called ‘foreigner talk’. This is a style of speech used by native speakers when talking to non-native speakers. The register employed by L1 persons may be deliberately simplified on the erroneous if well-intentioned belief that this is easier for L2 speakers to handle. In extreme cases it may lead to pidginisation (see below).

Even assuming optimal conditions researchers have noted that learners tend to use formulaic language, to employ avoidance strategies for structures which they perceive as difficult and to overuse structures they have already acquired. On the prosodic level, the rate of L2 speech is slower and somewhat more tense.

Frequently, L2 speakers negotiate meaning in their interaction with L1 speakers. By this is meant that when speakers of L1 and L2 do not understand each other, modifications to the formulations chosen by the L2 speakers are undertaken in the hope of improving communication. For their part, L1 speakers do not always reformulate utterances. Very often they just repeat them, frequently in a louder voice.

### 1.9.2 *Hypotheses and models*

There are various hypotheses about how SLA proceeds. One is the *identity hypothesis* which claims that L2 acquisition is largely similar to FLA. Evidence for this view is seen in the similarities between natural L2 acquisition and foreign language learning. A second hypothesis is the *interference hypothesis* which sees L2 as acquired against the background of L1, this then affecting the acquisition of L2 structures, frequently interfering with them. For instance, if a German learner of English says something like *I want that you come here* or *I am going tomorrow to Hamburg* then these ill-formed sentences of English can be traced back to the German equivalents *Ich möchte, dass du hierherkommst* (*möchten* ‘want’ take a subordinate clause introduced by *dass* ‘that’ as complement) and *Ich fahre morgen nach Hamburg* (adverbials of time – here *morgen* ‘tomorrow’ – precede those of place – *nach Hamburg* ‘to Hamburg’ – in German). The term interference is used for those cases where the structure of the native language of the learner is transferred to the target language. In order to distinguish the beneficial from the detrimental effects of interference a further distinction between positive and negative transfer can be made. The following is an example: an English-speaker learning Finnish will find that the distinction in vowel length in English is also present in Finnish and this feature does not present any difficulty, i.e. there is positive transfer of the vowel length feature from English. Not so for speakers of Slavic languages who find vowel length distinctions difficult to adhere to a second language which has such distinctions. Because of the unwanted effects of negative transfer on the target language, awareness of this is much greater than that of positive transfer. An important task of second language teachers is to raise learners’ consciousness with regard to

specific features in the target language which are likely to lead to interference with learners with a given L1 background.

There are also other views – apart from the identity and interference hypotheses – on the course of SLA. The American researchers Heidi Dulay and Marina Burt suggest that a universal cognitive mechanism is applied directly to the structure of target L2 and that this shows a ‘natural order’ which is independent of L1. The amount of interference can be shown to depend on the typological similarity between L1 and L2. In those cases where both languages are similar in structure a high degree of interference is to be noted among speakers (e.g. with Dutch and German, Polish and Russian, Spanish and Italian, etc.).

**Interlanguage model** The notion of interlanguage was first introduced by the American linguist Larry Selinker in 1972. It refers to the approximations to the target grammar which language learners show in the course of SLA. Interlanguage is characterised by transitional constructions which may but need not correspond to similar constructions in either L1 or L2. Due to such phenomena as backsliding and fossilisation (see above) learners do not always proceed smoothly through stages of interlanguage in their attempts to improve their competence in the target language.

**The monitor model** The American linguist Stephen Krashen introduced this model to account for discrepancies between classroom and informal performance and between that of individual learners in adult SLA. In his model the adult has two L2 systems: an acquired and a learned one. The acquired system is responsible for the initiation and production of speech. Before verbalisation, however, the learned system intervenes and checks the material which has been produced and, if necessary, corrects it with a view to making it grammatically acceptable. This process is called monitoring, hence the name of the model. The monitor is an editing device which is variously active with different speakers. Furthermore, different contexts can trigger the monitor to differing degrees. More formal situations such as foreign language teaching or grammar tests or careful speech provoke a greater degree of monitoring. The monitor can be seen to apply to L1 as well during normal (careful) enunciation. This is particularly true of pronunciation but also holds for syntax and vocabulary and is apparent in the choice of words.

Krashen’s model contains a number of hypotheses which are responsible for certain tasks in SLA. Of these, the most important is probably the input hypothesis which states that successful L2 learning is attained by learners receiving comprehensible input from their surroundings. In Krashen’s view successful acquisition/learning results from learners receiving input which is properly contextualised and so maximally comprehensible. If there is enough suitable input then learners will construct the necessary grammars mentally in order to produce correct target language.

**The discourse model** This was developed chiefly by the American linguist Evelyn Hatch in Los Angeles. It postulates a type of foreigner talk which is a simple register like baby talk and which affects the learning of an L2 when it is solely or largely the learner's input. Native speakers change their register when speaking to L2 adults and so peculiarities of this register were found in the L2 adult's output. However, this register shifts continuously and is difficult to pin down.

**The acculturation model** Associated with the work of John Schumann, this model attempts to account for the fossilisation of L2 acquisition among adults at a certain stage which is far from target-like. The reason for this, it proposes, lies in non-linguistic variables such as socialisation, integration into the L2-speaking community and identification with it. If speakers have low scores for these parameters, i.e. they fail to acculturate to the host culture, then pidginisation (see section ??? below) may occur. They involuntarily maintain social distance to the target-language group which obviously means that their command of this language does not improve with time as one would expect it to. This model rightly stresses the importance of identification with the target community for attaining acceptable competence in their language.

**The accommodation model** Developed by the Welsh linguist Howard Giles, this model highlights the tendency of learners to render their speech more like that of target language speakers. This imitative behaviour stems from the desire for social assimilation. Accommodation can also be seen to exist between different sections of a single-language community and many linguists view it as a strong factor in language change through dialect contact and assimilation.

### 1.9.3 *Methods of second language learning*

Much of SLA research is concerned with optimising methods of language teaching. To this end various methods have been devised and tested. Some go back several centuries, while others are quite recent. The most traditional is perhaps the *grammar-translation* method which lays its emphasis on drilling grammatical patterns and engaging in translation work, to and from the target language. This method is nowadays regarded as often unimaginative and not conducive to motivation in learners.

The *audio-visual* method is more recent and became popular in the 1960s and 1970s. It rests on the assumption that when more senses than one are involved in learning then the results are encouraging. This method uses videos and tapes, usually in language laboratories where learners can provide and obtain feedback to stretches of target language they are presented with. Along similar lines to this method is that of *autonomous learning* which stresses the independence of learners who are encouraged to make decisions concerning the manner in which they are exposed to the target language and how they should optimise their uptake of L2 information. Since the advent of powerful personal

computers, an extension to this approach has arisen, termed *computer-assisted language learning* (abbreviated to CALL) which sees the use of dedicated software as beneficial in the learning of foreign languages. The available software for language learning has increased greatly in sophistication in the past decade or so and now allows users to interact intelligently with programmes and to consult specially tailored audio and visual data for learning purposes.

## **1.10 Language and the brain**

The study of language in relation to the brain is called *neurolinguistics*. This is a special field which is becoming increasingly the focus of interest of linguists. It is true that it is not possible to pinpoint linguistic activity in the brain, to put the transmission of minute electrical currents between nerve cells in correlation with the use of language. Nor can linguistic structures be assigned to the information stored in these cells. Although the ultimate goal of linking biochemical processes in the brain with production and reception of language is still a very distant one, the field is one which has produced significant research results. First and foremost in the area of aphasia – disturbances in the normal functioning of language, for whatever reason.

### *1.10.1 The structure of the brain*

The *cerebrum* is the part of the brain under the skull and is divided into two sections of equal size, called hemispheres. These are joined by a ‘bridge’ of thick fibres called the *corpus callosum*. Each hemisphere of the brain controls the opposite half of the body, i.e. the left hemisphere is responsible for controlling the right half of the body and vice versa. The outer layer of both halves is called the cortex (and is greyish in colour when the brain is prepared after death, hence the colloquial term ‘grey matter’ for the brain). It contains a vast number of neurons (nerve cells) – something in the region of  $10^{10}$  (100 billion) – all of which are interlinked by nervous fibres which allow communication between the nerve cells. The communication away from a nerve cell takes place along axons which are coated by a sheath of myelin. The pathways to the nerve cell are along dendrites. The central area around the nucleus of the cell is called the soma.

Signals between nerve cells must cross synapses, gaps in the membranes which are found between neurons. These synapses are junctions across which information can flow or be impeded (depending on the concentration of chemical substances such as dopamine). The information is carried by neurotransmitters. These are released when an action potential (an electrical impulse) builds up on one side. They cross the synaptic space and dock into receptors leading to the action potential being generated on the receiving side. After this there is a re-uptake of neurotransmitters into so-called vesicles which hold them until required for a future signal. The same principle is used not just in the entire

brain, including parts responsible for language, but between nerve cells and muscle cells in various parts of the body.

Many functions of the brain are associated with one of the halves. The assignment of these functions to a certain half is called lateralisation and is completed before puberty. This means that a dysfunction of an area of the brain after this watershed cannot be compensated for by the transfer of the associated functions to the opposite half of the brain. Puberty is also the cut-off age for acquiring a language with native-like competence (see remarks above).

From investigations of patients with impairments to both speech production and understanding, which were carried out in the second half of the 19th century, one knows that there are two key areas in the brain associated with these basic language functions.

- 1) *Broca's area* is named after the French surgeon Paul Broca (1824-1880) who described the area in 1864. This area is approximately an inch in size and is located towards the temple in the left hemisphere of the brain and is associated with language production.
- 2) *Wernicke's area* is named after the German scientist Carl Wernicke (1848-1905) in 1874. The area is slightly larger than Broca's area is to be found behind the left ear and is responsible for the understanding of language.

Between the two areas there is a band of fibres known as the *arcuate fasciculus* which is responsible for repetition and feedback in language and damage to which leads to conduction aphasia (see below). There is also an area on the top of the brain which is involved in the muscular movements and coordination during speech production. It is known as the *supplementary motor area*.

### 1.10.2 *On the tip of your tongue*

An interesting feature of human language is that when searching for a word, retrieval is normally instantaneous. However if not, then it may prove impossible to find the word one is looking for. What is interesting in these cases is what one comes up with instead of the word which one is looking for. The most common situation is where one thinks of words which are phonologically related to the word one is looking for. Here is a real life example. A lecturer was once trying to remember the name of a student when talking to a colleague. He knew it began with /k-/ and the colleague made a number of suggestions to help him find the name, e.g. *Karin, Katja, Karla*. The person in question was adamant that none of these was correct, because he claimed the name had more than two syllables. After racking his brain a bit further he suddenly struck on the name, *Katharina* which has four syllables.

When searching for a word, one sometimes hits on words which are somehow related semantically to the one being looked for. One speaker, when looking for the word *impairment*, found that other words like *impediment*,



*impeachment* came to mind before the right one was found. In another instance, looking for the word *insolvent* led to the words *liquid* and *glue* coming to mind. Equally one could cite the times when speakers say *right* for *left*.

Now what does this tell us about lexical retrieval, the process of finding words in one's long term memory? Phonological similarity is important. But that is not all, semantic similarity or difference, particularly oppositeness, can often play a role. The conclusion to be drawn here is that the connections between words are manifold and that the retrieval mechanism can get 'stuck' and that no amount of conscious effort will free it. Instead one must give up. Frequently when one stops trying, the word comes to mind. With increasing age, lexical retrieval becomes less efficient, something one can see with older persons who are often stuck for words.

### 1.10.3 *Slips of the tongue*

In certain situations, such as when one is tired or nervous, one's language production is not all it should be. One frequently makes mistakes in the formation or ordering of words. These are known collectively as 'slips of the tongue' and are quite different from the mistakes which people make in a second language due to incomplete knowledge of grammar.

Slips of the tongue have attracted the attention of scholars from various fields, the most famous of whom was Sigmund Freud (1856-1939) who believed that slips of the tongue reveal unconscious thoughts and desires. Linguists, on the other hand, believe that slips of the tongue occur because speakers 'stumble' when speaking and exchange parts of words or sentences in the process.

The curious aspect of slips of the tongue is that they essentially concern the syllabic structure of words. Consider the following examples.

*He's just caught a new bar.*                    (...bought a new car.)  
*Put the plates in the wishdasher.*        (...dishwasher.)

What has apparently happened in both these cases is that the syllable onsets (roughly the consonant before the vowel) of two words, or two elements of a compound, have been exchanged. This is the most common type of slip of the tongue and it known as a *spoonerism* after the Oxford don Rev. W. A. Spooner in the 19th century who was noted for making them as the well-known example *You have hissed all my mystery lectures and tasted the whole worm* is supposed to show. Such extreme instances may be contrived, or at least manipulated, not just to illustrate the phenomenon but to give a ridiculous sense as well. But what they do show is that mentally we organise words according to the syllable onset and the syllable rhyme (the vowel and any consonant(s) after this).

### 1.11 Language pathology

A central concern of neurolinguistics is the study of language impairment. This can result from a number of causes all of which mean that individuals suffer a reduction – from slight to severe – in language performance. Common reasons for such impairment are the following.

- 1) Injury to the head, typically in an accident
- 2) The growth of a tumour in the brain
- 3) A stroke resulting from an interruption of blood supply to a part of the brain, e.g. due to a clot or a bursting vessel.
- 4) Severe loss of brain tissue with Alzheimer's disease

The shrinkage of the brain with Alzheimer's disease typically affects the hippocampus which is why loss of memory is an obvious symptom. Language impairment is not always present but an increased occurrence of anomia (difficulty in finding words or in remembering names of people or places) can be observed. Alzheimer's disease is progressive and invariably leads to death, typically within 5 to 15 years. Note that the other brain disease which can affect older people, Parkinson's disease, does not stem from a loss of brain tissue but results from the degeneration of the basal ganglia (nerve cells at the base of the brain) with the attendant deficiency of dopamine, a neurotransmitter in this area.

A stroke is usually the result of hypertension (abnormally high blood pressure leading to brain haemorrhage) or arteriosclerosis (plaque of fat deposits on the inside of arteries leading to blockage) and typically affects the motoric aspect of speech. This condition is termed *dysarthria*. The damage on blockage results from the blood supply to the brain being interrupted. The deprivation of oxygen which this entails leads to brain tissue dying quickly. Rehabilitation of stroke patients is variously successful depending on the area of the brain affected and the extent of the damage. Speech therapy in the first six months after the stroke can be surprisingly beneficial. However, with moderate to severe strokes difficulties in speech production generally remain with patients' speech being unusually slow, consisting of unexpected pauses and short, often incomplete sentences.

A cancerous growth in the brain results in pressure on the nerves and nerve cells around it. The gradual impairment of a certain function, such as sight, might be an indication of a growing tumour. If the tumour can be located and is accessible it can often be removed successfully and the function which was affected recovers.

Injury to the head from an external source is most common as a result of an accident, which in today's world is most commonly a traffic accident. The most benign type of injury leads to concussion which may lead to a temporary loss of consciousness after which the individual may suffer from nausea and headache. The lasting effects of concussion usually affect memory, in some cases leading to

loss (amnesia). The language faculty is not usually affected in such cases. When injury to the head has been more severe, particularly to the left side of the head, language and other functions can be seriously impaired. Because of the wide range of injury from external sources, individual speech therapy is necessary after initial recovery.

There are pathological conditions which have an adverse affect on language performance. First and foremost is *autism*, a condition of abnormal development, mostly in males, which sets in during early childhood. In general autistic individuals are characterised by a lack of responsiveness to their environment, both on an emotional level towards their parents and on a social level towards other people in their environment. Autistic children may show a delay in acquiring their native language with their first words not appearing before 2 years of age. However, there is a condition related to autism, called *Asperger syndrome*, where there is no such delay.

Autism is a scalar phenomenon with individuals occupying some position on a continuum from mild to severe. There are several theories concerning its cause. Some scientists have looked for a neurological basis and have found that autistic individuals have a deficient *amygdala*. This is an almond-shaped part of each brain hemisphere which is associated with feelings and important for learning and memory. With autistic persons the amygdala is either reduced in size or relatively inactive in empathizing tasks, or a combination of both.

### 1.11.1 *Types of impairment*

The general term for linguistic impairment is *aphasia*, lit. ‘lack of speech’, though other terms such as *dysphasia* ‘disorder of speech’ have been suggested as a cover term. Aphasiac disorders typically involve damage to some part of the brain as outlined above. Typically they involve either the speech production (Broca) or speech understanding (Wernicke) areas in the brain or perhaps the *arcuate fasciculus* or the *supplementary motor area* (see section *The structure of the brain* above).

When discussing aphasia, scholars use the modifier *fluent* for any kind of language impairment in which the motoric aspect of speech production is not affected. Where this is the case, the term *non-fluent aphasia* is used.

Broca aphasiacs, those suffering from motor aphasia, have typical disturbances in their speech. It is slow and difficult, such speakers seem not to manage grammatical rules, though their vocabulary is normally intact. The type of aphasia where speakers show a lack or confusion of grammatical words by e.g. omitting formatives and often inflectional endings is termed *agrammatism*.

Speakers with disturbances in the Wernicke area, those suffering from sensory aphasia, can speak normally though what they say often makes little sense. Their sentences are semantically incongruous.

Interestingly, Broca aphasiacs are aware that their speech is deficient and tend to respond to remedial treatment whereas Wernicke patients do not as

they do not think that there is anything wrong. Both types of aphasiacs suffer from the inability to find words, technically known as *anomia*. The Broca area lies quite close to that which controls motor movements whereas the Wernicke area is close to the auditory area. There is a set of connective fibres between the Broca and the Wernicke areas, called the *arcuate fasciculus*, and damage to this causes *conduction aphasia* whereby speakers can speak to some extent, retain good comprehension but are incapable of repeating what is said to them.

There is also a rare symptom called *isolation aphasia* in which the production and comprehension areas become severed from the rest of the brain. Speakers with this impairment can neither produce nor comprehend sentences and only repeat set phrases which were learned in childhood.

It is interesting to note that aphasia affects people's ability to use sign language just as much as with ordinary language. Different types of aphasia can give us information about the structure of normal language. For instance, people with left-hemisphere strokes may sometimes use nouns but not verbs. This is also true when the nouns and verbs have the same form, so that speakers could understand and produce a sentence like *She prefers butter to margarine* but not *She buttered the toast while it was still hot*. This would imply that nouns and verbs are stored differently.

#### *Further types of language impairment*

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*dementia* A decline in cognitive ability due to brain damage or as a result of old age (senile dementia). This usually entails a general decline in language performance which can be labelled *global aphasia*.

*dyslexia* A condition in which individuals often fail to connect the written and the spoken word. Such persons have difficulty with reading and spelling, irrespective of their level of education. The diagnosis of dyslexia is problematic as it occurs to varying degrees and it is notoriously difficult to determine when it is pathological. Also called *alexia* or *word blindness* (an inability to recognise words from their written form). Dyslexia may be an acquired condition with individuals who were previously literate.

*dysgraphia* Difficulties with writing after damage to the brain. The equivalent to dyslexia in writing.

#### **Summary**

- *Psycholinguistics* is a large area concerned with the relationship of language and mind, with the acquisition of language and with possible disturbances to normal functioning. *First language acquisition* is closely related to linguistic theory, *nativism* assumes that we have an innate predisposition to acquiring language, which *behaviourism* (in its purist form) does not.
- *Language and mind* is a field which tries to establish the relationship

between our cognition, 'how we think' and language, 'how we speak'. In particular it examines the structure of our cognition and compares it to that of language in general and often to individual languages. The latter sub-area is often termed *linguistic relativity*.

- *First language acquisition* is divided into two main types, first and second, depending on when the individual starts the language. First language acquisition begins with birth and the production of the first word after about nine months to a year. There are clearly recognisable *stages* and processes in early childhood, the most common process is *overextension* and the stages are one-word, two-word and multi-word stages. By the age of 5 or 6 every child has acquired the basic structures of his/her native language.
- *Second language acquisition* normally begins in school and is a *guided* process which continues beyond puberty, indeed often only starts then. There are various views about how this proceeds, for instance, independently of the first language or dependent on it. Different *models* have been developed to devise optimal methods for second language instruction.
- The *physical basis for language* is in the brain but cannot be directly observed. However, correlations between certain traumata, resulting from a stroke or injury, and certain *linguistic impairments* – known collectively as *aphasia* – have been established. *Language pathology* is the area which investigates these occurrences and has a practical side in *remedial linguistics* which is part of rehabilitation and also concerns itself with acquired or innate *speech defects* (usually phonetic).
- Certain *performance errors*, such as *slips of the tongue*, are linguistically interesting as they reveal information about the way we store language structures, e.g. syllables.