

A Glossary of Language and Mind

JEAN AITCHISON

aphasia

child language

dyslexia

therese

mental lexicon

sign language

transposition

innateness

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**A GLOSSARY OF
LANGUAGE AND MIND**

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Introduction

Psycholinguistics, the study of language and mind, is the subject which links psychology and linguistics. As one might expect, it is studied by both psychologists and linguists.

Yet these two types of people tackle the topic in different ways. Many psychologists probe into language and mind by carrying out strictly controlled experiments. Linguists, on the other hand, prefer to study speech in naturalistic settings.

Both ways have advantages and disadvantages. The care and control found in psychological experiments guarantees that any result which finds its way into print has been checked out rigorously. But the work of psychologists is bedevilled by the so-called 'experimental paradox': the more carefully controlled the experiment, the more unreal and unnatural the situation, the more likely it is that those being tested have devised one-off strategies for handling a non-natural event. Linguists, meanwhile, guarantee that relatively little is omitted when they explore naturalistic language in natural settings. But the drawback is obvious: cartloads of information are obtainable from almost every sentence. Linguists have to take care not to drown in data. The views of both psychologists and linguists, therefore, need to be considered and amalgamated.

Psycholinguistics is a subject which has expanded dramatically in the last fifty years. In the first half of the twentieth century it was a minor topic of interest to a few psychologists, who looked mostly at single words, and how they might be linked to others. But it has now become a major sub-discipline

within both psychology and linguistics. It sprawls in all directions. Just as a street market which once sold vegetables might expand into having stalls for meat, flowers, books, even second-hand furniture, so psycholinguistics has turned itself into a vast academic hypermarket which has imported goods from a number of other disciplines.

The core topics within psycholinguistics are comprehension (how people understand speech), production (how humans produce speech) and acquisition (how children learn language). These branches of the subject burgeoned in the 1960s. In recent years psycholinguistics has been supplemented by information on language and the brain (neurolinguistics), on speech disorders (clinical linguistics, aphasiology), on the dictionary in the brain (the mental lexicon), and on animal communication (which explores to what extent other species either naturally have some of the properties of human language, or are able to acquire them). Psycholinguistics has also been influenced by the new, interdisciplinary area of cognitive science – an amalgam of linguistics, psychology, philosophy and artificial intelligence.

In the first half of the twentieth century, psycholinguistics was a minor topic which primarily looked at individual words, and tried to find out which ones might be closely associated, as with *sister* and *brother*; *husband* and *wife*, *rose* and *flower*.

But then it all changed. 1959 is sometimes taken as the starting point of the modern era of psycholinguistics. That year, the linguist Noam Chomsky published a highly critical review of a book, *Verbal behavior* (1957) written by the prominent behaviourist B. F. Skinner. Behaviorist psychologists claimed that all learning was a case of breaking the learning down into very small steps, and repeatedly rewarding the learner. This had proved effective in the training of rats and pigeons. Skinner argued that the procedure could be extended to humans learning language. But in a witty and devastating review, Chomsky argued that rats learning how to press levers

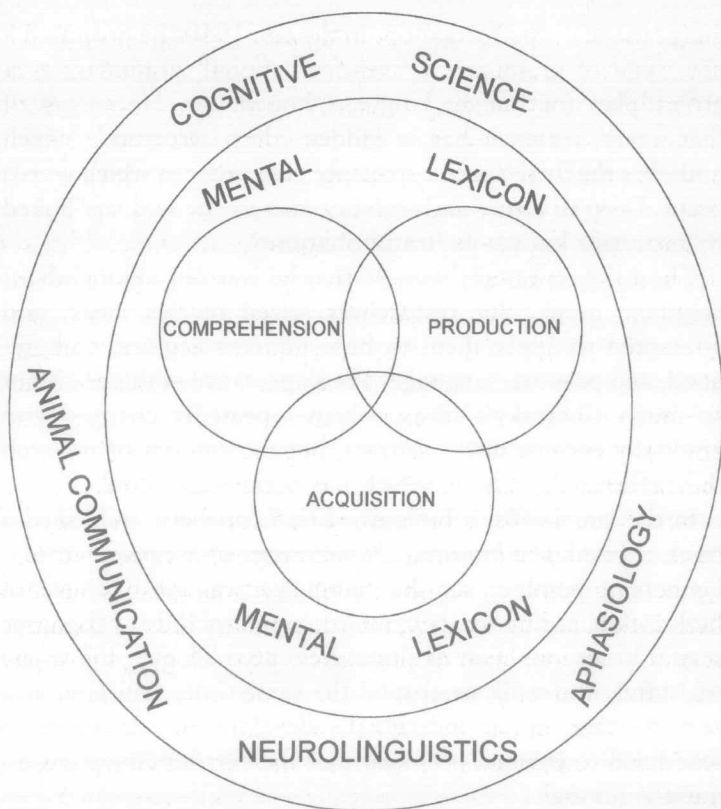


Fig. 1 Psycholinguistics

to get food could not be compared to humans acquiring language, which is far more complex. Chomsky suggested that, far from being an accumulation of simple steps, language was a unique, specialised skill: humans might be innately programmed to talk, he asserted, a viewpoint that is now widely accepted. This heady suggestion was the yeast which made the dough of psycholinguistics rise and expand.

Chomsky himself was concerned primarily with abstract linguistic knowledge or 'competence' rather than actual lan-

guage usage or 'performance'. In the late 1950s he proposed a new type of grammar; a 'transformational' grammar, as a groundplan for human language knowledge. He suggested that every sentence has a hidden 'deep structure', which underlies the final 'surface structure', the order in which words occur. Deep structure and surface structure, he said, are linked by processes known as 'transformations'.

Chomsky repeatedly warned that he was not talking about language usage. But researchers seized on his ideas, and attempted to apply them to how humans acquire, comprehend, and produce, language. The importance of this era is not so much Chomsky's ideas, which repeatedly changed and gradually became more abstract, but the amount of research they generated, some of which has permanent value.

In the late 1960s, a biologist, Eric Lenneberg, published a book entitled *The biological foundations of language* (1967). Lenneberg pointed out that language was an example of biologically controlled behaviour, comparable to walking or sexual behaviour. Just as normal children all over the world sit, stand, and walk at around the same time, similarly, at a certain stage in an individual's development, language is scheduled to emerge, provided that the surrounding environment is normal.

This idea is now widely accepted, though the terminology has changed. Nowadays, researchers talk about 'innately guided learning'. Children, by nature, have a broad general notion of how to tackle the sounds they hear coming out of people's mouths, and how to organise them into a layered 'grammar'.

The realisation that language is innately guided triggered an immense amount of careful work on how children build up knowledge of their language. Youngsters' utterances were collected and analysed, and later, so were the utterances of their parents, to see how much parents and children influenced one another. The upshot is that children turn out to be active

puzzle solvers. They have inherited an understanding that the sounds coming out of people's mouths are worth listening to, and that it is their task to make sense of them. They instinctively know how to figure out the structure of their language, just as songbirds intuitively learn how to sing.

The tidal wave of enthusiasm for psycholinguistics engulfed mature speech as well. Studies of speech comprehension were mostly carried out on adults. Understanding language turned out to be a mixture of knowledge and guesswork. Humans, when listening to a flow of words, could not be taking down a mental dictation; speech is just too fast. And the sounds are too varied: each speech sound is different depending on its place in a word, and who is saying it. Instead, listeners hear a few bits and pieces, and then jump to conclusions, based on their knowledge of the language they are hearing.

Humans actively consider several possible interpretations as they hear a word or group of words, before they make a final decision. The possible words behave as if they were horses competing against one another in a race. This competition happens in a fraction of a second – so fast and subconsciously that hearers are often unaware that they are considering several possibilities before they make their decision.

Producing speech is also a complex process. Again, words and structures appear to compete against one another like horses, and sometimes end up in a dead heat. Then they can get jumbled up together, as in *buggage*: the speaker meant to say either *baggage* or *luggage*, and somehow said both. Such 'slips of the tongue' can provide valuable information about the hidden stages of speech production.

All in all, far more is going on in the mind than anyone ever realised. The brain is a buzzing hive of activity, as is confirmed by brain scans. But interpretation of the scans is proving a challenge to researchers: even simple repetition of a heard word involves a huge amount of electrical activity in different brain areas.

The area covered by language and mind has therefore grown from a narrow stream to a flooding river, with multiple books and an ever-expanding vocabulary.

This is where this Glossary can help. The Glossary can be used in two ways: first as a simple dictionary, when someone reading another book comes across a term unknown to them, such as, say, *bootstrapping*, *dysarthria*, *neoteny*, *parameter setting*. The term will be explained, and the reader directed to related entries. Second, the Glossary can be used for browsing. Some of the headings are broad outline ones, such as *speech comprehension*. This entry gives the main subcomponents of this process, which can then be looked up. An extensive system of cross-referencing then refers the reader to other connected topics. In order to avoid frustrating the reader too much, there is a certain amount of overlap in the entries. This allows many entries to be complete in themselves, even though ideally the reader will want to gain further information by checking the cross-references.

But this brief book can provide only a glimpse of the complexities involved in learning and using speech. At the end of the Glossary, an annotated bibliography is given, with reading suggestions, in the hope that readers will want to press on and find out more about language and the mind. The book is a revised, updated and expanded version of the author's *Introducing Language and Mind* (Penguin 1992).

A

a-/an- A prefix of Greek origin, meaning 'without'. It is found in the name of several language disorders, where it usually means 'having severe difficulties with'. For example, **aphasia** is literally 'without speech', but normally means 'with serious speech problems'. Similarly, **alexia** literally 'without reading', **agraphia** 'without writing', **anomia** 'without naming ability', **anarthria** 'without muscular control'. These all mean 'severe difficulties with' rather than total lack. In some cases, the prefix *a-* is used interchangeably with terms beginning with *dys-* 'difficulty with', as in **anarthria/dysarthria**, though mostly either the *a-* term or the *dys-* term has won out over the other, as in **aphasia** for speech disorders, and **dyslexia** for reading disorders. Nowadays, some writers use *a-* for acquired disorders (those that occur as a result of damage in the course of life) and *dys-* for developmental or congenital ones (those in which the ability has never developed). (See also **acquired disability**.)

access route vs linguistic representation The route to a word which a person is trying to identify or find (access process) may differ, according to some psycholinguists, from the way that word is represented linguistically in the mind.

acoustic variance Different patterns in the sound waves associated with a single speech sound. A sound such as [p] is likely to vary considerably, depending on the sounds around it, the care with which it was said, and the person who said it. It is therefore said to be 'acoustically variant'. This variability is one reason why **speech perception** is a complex process. (See also **speech comprehension**.)

acquired disability A handicap which arises as a result of damage during a person's lifetime. It is contrasted with the term *developmental disability*, which indicates a condition of unknown origin, which may have been predestined from birth. Someone who experiences reading difficulties as the result of a stroke would have *acquired dyslexia*, whereas a child who had never been able to learn to read normally would have *developmental dyslexia*. A disability which was definitely present at birth is sometimes referred to as a *congenital disability*.

acquired dyslexia see **acquired disability; dyslexia**

acquisition (of language) Mastery of language. *Acquisition vs learning* is considered to be an important distinction by those who think that child language acquisition differs in nature from adult language learning: they argue that adults are exposed to language outside a **critical period** set aside by nature for acquiring language. However, recent research has thrown doubt on a fixed 'critical period', and suggests that it might be more accurate to speak of a **sensitive period**: a time when children are particularly 'tuned in' to acquiring language, and which gradually diminishes in strength. *Acquisition vs emergence* is a distinction between complete mastery of a linguistic structure versus its first appearance. For example, intermittent plural forms in -s (*cats, bees*) may emerge

several months before plural endings are reliably acquired, with acquisition usually measured as their occurrence in ninety per cent of the places where an adult would expect them. (See also *sensitive period*, *child language*.)

acquisition vs emergence see *acquisition (of language)*

acquisition vs learning see *acquisition (of language)*

actor-action-object strategy see *canonical sentoid strategy*

agrammatic aphasia A speech disorder in which a patient's ability to produce linguistic structures is seriously impaired. Typically, the patient has considerable difficulty in producing speech, and utters mainly content words (those which contain meaning) with hardly any word endings, and with very little linking them together: *Bed . . . ah . . . Peter come . . . night*. Such a patient is usually able to comprehend speech fairly well. According to some researchers, the patient really knows the grammar, but has difficulty in remembering the form of the 'little words' involved. However, many patients have other problems as well, including some (minor) comprehension difficulties. A complicating factor is that people with agrammatic symptoms sometimes have different underlying disorders. The condition is also known as *Broca's aphasia*, and is often associated with damage to anterior (front) portions of the brain, particularly a location known as Broca's area. (See also *aphasia*; *Broca's area*; *localisation*.)

agraphia see *dysgraphia*

AI see *artificial intelligence*

Alex The name of a grey parrot who has learned a certain amount of language. At one time, all birds were thought to be 'bird-brained' and incapable of anything more than 'parrotting' (repetition). But Alex can correctly label more than thirty objects (grape, key, chair, etc), a number of colours and several shapes. He can also respond to questions asking whether colours and shapes are the same or different.

alexia see **dyslexia**

Alzheimer's disease see **DAT**

ambiguity The possession of more than one possible meaning. This can be subdivided into *lexical ambiguity*, when a single word can have more than one meaning, as in *The detective examined the log* (fallen tree or record of a ship's voyage?), and *structural ambiguity*, when the arrangement of words gives rise to more than one interpretation. The latter is sometimes subdivided: *surface structure ambiguity* is said to occur when the words can be grouped in different ways, as in *hot soup and pies*. Is it *hot* [*soup and pies*], with both items of food heated up? Or *hot soup* [and pies], with the pies remaining cold? *Deep structure ambiguity* is said to occur when the source of the ambiguity is less easily identifiable, as in *The duck was ready to eat*. Is the duck about to eat or be eaten? Ambiguous words and structures are important for the information they can potentially provide about the way in which humans comprehend sentences. Research indicates that humans may briefly notice all common meanings of an ambiguous word, even though they are not consciously aware of doing so, then discard the unwanted ones. There is less agreement over the treatment of structural ambiguity. Some researchers argue that hearers notice only one

meaning, and then retrace their steps if they have made a mistake and been led 'up the garden path'. Others argue for a brief consideration of more than one interpretation, even though hearers might not realise they are doing this. (See also **garden-path sentences**; **perceptual strategies**; **speech comprehension**.)

American Sign Language see **sign language**

Ameslan (American Sign Language, ASL) see **sign language**

analysis-by-synthesis see **motor theory** (of speech perception)

anarthria An inability to speak caused by muscular weakness. The term is sometimes used interchangeably with *dysarthria*, which in theory is less severe. Anarthria is commonly associated with other physical symptoms such as difficulty in chewing and swallowing. The central speech processes are normally intact, and the patient is simply unable to pronounce the speech which he or she has planned, as sometimes occurs in sufferers from Parkinson's disease. (See also **a-/an-**.)

animal communication The natural systems by which non-human animate beings convey information to one another. This may be via sound (dolphins, birds), sight (sticklebacks), touch (ants), or smell (moths). The interest of these systems lies in their similarities to and differences from human language. Human language contains several **design features** which are rare or non-existent in animal communication: most notable of these are **creativity** (ability to produce novel utterances), **displacement** (ability to refer to objects and events removed in time and space) and **structure dependence** (the presence of internal structure). There is a **continuity vs discontinuity** dispute between

researchers. Some argue that human language developed out of an earlier animal system. Others claim that it is totally different. Natural animal communication systems need to be kept distinct from attempts to teach signs to apes based on human languages. (See also **ape signing**; **bee dancing**; **delphinology**.)

anomia Severe word-finding problems, literally 'without naming ability'. This is common in all types of **aphasia** (speech disorders). It occurs in a mild form in almost everybody, and usually gets worse as a person gets older. The **TOT** ('tip-of-the-tongue') **phenomenon** is the well-known feeling that an elusive word is 'on the tip of one's tongue'. Experimental studies of this have provided some insight into how people find the words they want when producing speech (**word retrieval**). (See also **speech production**.)

anticipation error The premature (too early) insertion of a sound, syllable, word or sign when speaking, reading, writing or signing. For example: *There's a shalt . . . salt shortage*; *It's amazingly how quickly people pick these things up*; *Unwieldy people . . . unscrupulous people can wield too much power*. Such **slips of the tongue** (speech errors) are important, because of the information they provide about the process of **speech production**. Anticipations are **assemblage errors**, in that the correct items have been selected, but then wrongly assembled, as opposed to **selection errors**, where a wrong choice has been made. Anticipations are the commonest type of assemblage error. They suggest that speech is planned some way in advance of being uttered. They also give clues as to the size of the chunks which are pre-prepared. Similar information is given by anticipations in reading, writing and signing. (See also **slip of the eye**; **slip of the hand**; **speech production**.)