

# Reflection on Language and First Language Acquisition

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## 1. Introduction

Acquisition of a language is, to Chomsky, learning in a peculiar sense. It is internal development in response to vital, but comparatively trivial, experience from outside. Language acquisition is more akin to growing than to learning, it is the maturing of the mind according to a present biological clock. Language is part of human inheritance, it is in our genes, a part of biology, "universal grammar is a part of the genotype specifying one aspect of the initial state of human mind and brain." (Chomsky, 1980).

It is coincident that many studies in biology have been aiming at language studying. The interdependency of biological science and the study of mind is reciprocal. "There is a common enterprise: to discover correct characterization of the language faculty in its initial and attained state, to discover the truth about the language faculty." (Chomsky, 1985)

Frankly speaking studies in biology have given many important evidence on language studies that cannot be ignored. This paper aims to have an introduction to those evidences

from biology in support of universal grammar so that we can reconsider universal grammar proposed by Chomsky from a scientific perspective.

## 2. Physical realization of speech organs

If we look at the speech organs there seems to be no correlation between speech organs and language production. But if we first assume that all humans speaks a language, then a number of puzzling biology facts fall into place. They can be viewed as partial adaptations of the body to the production of language.

### 2.1 human teeth

Human teeth are unusual compared with those of other animals. They are even in height and form an unbroken barrier. They are upright, not slanting outwards, and the top and bottom set meet. The evenly spaced, equal-sized teeth touch one another valuable for the articulation of a number of sounds, [s], [f], [v] and so on.

### 2.2 human lips

They have muscles which are considerably more developed and show more intricate

interlacing than those in the lips of other primates.

### 2.3 mouth

A human mouth is relatively small, and can be opened and shut rapidly. This makes it simple to pronounce sounds such as p and b, which require a total stoppage of the airstream with the lips, followed by a sudden release of pressure as the mouth is opened.

### 2.4 human tongue

The human tongue is thick, muscular and mobile, the advantage of a thick tongue is that the size of the mouth cavity can be varied allowing a range of vowels to be pronounced.

### 2.5 larynx

Human larynx contains the vocal cords. It is much simpler in structure than that of other primates. But this is an advantage. Air can more freely pass and then out through the nose and the mouth without being hindered by other appendages. Biologically, steaming and simplification are often indications of specifications for a given purpose.

### 2.6 lungs

Although there is no apparent peculiarity in the structure of four lungs, our breathing seems to be remarkably adapted to speech. A human submerged under water for more than two minutes will possibly drown. Anyone who pants rapidly and continuously for any length of time usually faints and sometimes dies. Yet during speech the breathing rhythms altered quite noticeably without apparent discomfort to the speaker. The number of breaths per minute is reduced. Breathing-in is considerably accelerated, breathing-out is slowed down. Yet people frequently talk for an hour or more with

no ill effects.

It seems that there are clear indications in the mouth, larynx and lungs that we speak naturally if all the adaptations are reflected upon objectively.

## 3. Physical realization of human brains

The human brain is very different in appearance from that of other animals. It is heavier, with more surface folding of the cortex, the outer layer of "Grey matter" which surrounds the inner core of nerve fibres. As in a number of animals, the human brain is divided into a lower section, the brain stem, and a higher section, the cerebrum. Different sections of the human brain have been preserved to function differently in language production and comprehension.

### 3.1 Lateralization of human brains

As the child's brain matures, various functions become lateralized to the left or the right hemisphere. The left hemisphere is associated with logical, analytical thought, with mathematical and linear processing of information. The right one perceives and remembers visual, tactile, and auditory images; it is more different in processing holistic, integrate, and emotional information.

#### 3.1.1 Dichotic listening tests

A simpler method for discovering which hemisphere controls speech is the use of dichotic listening tests. The subject wears headphones, and is played two different words simultaneously, one into each ear. For example, he might hear six in one ear, and two in the other. Most people can report the word played to the right ear ( which is directly linked to the left hemisphere) more accurately than the

word played to the right ear (linked to the right ear). It is clear that this is not simply due to an overall preference for sounds heard in the right ear, because for non-linguistic sounds the left ear is better. It is concluded that the left hemisphere is better at processing linguistic signals and so is normally the dominant for speech.

### 3.1.2 Experiments involving "split brain" patients

In the reported experiment, in case of severe epilepsy it is sometimes necessary to sever the major links between the two hemispheres. This means that a patient has virtually two separate brains, each coping with one half of the body independently. A patient's language can be tested by dealing with each hemisphere separately. An object shown to the left visual field is relayed only to the right. Yet sometimes the patient is able to name such an object. This indicates that the right hemisphere may be able to cope with simple naming problems-but it seems unable to cope with syntax.

From the above we can conclude that the two hemispheres of human brain functions differently. And "this lateralization on localization of language in one half of the brain, then, is a definite, biological characteristic of human race." (Aitchison, 1998)

## 3.2 Broca's area and Wernicke's area

### 3.2.1 Broca's area

Broca is a French surgeon. In 1861 Broca noted that a post-mortem that two patients who had had severe speech defects had significant damage to an area just in front of, and slightly above, the left ear-which suggested that this area, now named 'Broca's area', is important for speech.

The experimental methods was carried out in the 1950's by two Canadian surgeons,

Penfield and Roberts (1959). They were primarily concerned with removing abnormally functioning cells from the brains of epileptics. But before doing this they had to check that they were not destroying cells involved in speech. So with the patients fully conscious, they carefully opened the skull, and applied a minute electronic current to different parts of the exposed brain. Electrical stimulation of this type normally causes temporary interference. So if this area which controls leg movement is stimulated, the patient is unable to move his or her leg. If this area controlling speech production is involved, the patient is briefly unable to speak.

### 3.2.2 Wernicke's area

The section of the brain involved in the actual articulation of speech seems to be fairly distinct from those involved in its planning and comprehension. Perhaps the majority of neurologists agree that some areas of the brain are statistically likely to be involved in speech planning and comprehension. The region around the and under the left ear. Which is sometimes called Wernicke's area after the neurologist who first suggested this area was important for speech. Damage to Wernicke's area often destroys speech comprehension.

## 4. "Multiplicity of integrative processes"

Multiplicity of integrative processes takes place in speech production and comprehension. Speech depends on the simultaneous integration of a remarkable number of processes. According to Aitchison, three processes are at least taking place simultaneously in speech, "first, sounds are actually being uttered; second, phrases are being activated in their phonetic form ready for use; third, the rest of the sentence is being planned" (Aitchison, 1998).

Perhaps each of these processes is possibly more complicated.

During the past 30 years linguists and psychologists have been focusing on the complicated "multiplicity of integrative processes". The results reveal that the fundamental properties of language production and comprehension is not changeable and a constant. Fordor (1992) concluded their basic properties as the following:

1. the language perception is domain specific. Language perception is not the same as other psychological activities. It can be inferred that language perception is manipulated by a specific device dealing with language production and comprehension.

2. The process of language perception is mandatory. As long as one hear the language he hears, he will comprehend it unconsciously and consciously.

3. The process of language perception is high-speeded.

4. Language perception is informationally encapsulated. That is, the processing will be completed simultaneously of sounds, tunes, words and syntax.

5. Language perception is processed by a fixed neurological construction.

6. Specific speed and order will be revealed during the process of language perception of a child.

These properties show that language perception, especially its mandatory feature and high-speedness will never be learned and any triggering can be ignored. It also shows that language perception is a gifted competence genetically and independent of idiosyncratic language.

## 5 Conclusion

As for biology, the developments and behaviors of organisms are conducted by the internal genetic orderings. An individual acquired a set of genotypes, which develops and matures into a specific type through the triggering of the environment. To Chomsky, language is a phenomena controlled by genetics. Human beings have a specific set of genotypes for language processing, and the interaction of the genotypes with primary language materials forms the various linguistic systems.

The set of genotypes in human beings are the same, which determines the universalities of languages. All the adaptations to language productions and comprehensions also had provided abundant evidence for the universalities in human body. With the development of science, it will be confirmed in the end whether the hypothesis will survive or not, the research of UG will be improved.

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