THE RELATIONSHIP BETWEEN LANGUAGE AND THE BRAIN

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ABSTRACT
The contribution of Akmajian et al is also given in respect to this paper. This article gives the features of both human and animal communication in relation to the brain it further gives the account of language comprehension in the brain, and the important parts of the brain which receive information (RH and LH). Some linguistic contributed to the language process, given by Aitchison and Taylor and Taylor, on how brain process language.

1. INTRODUCTION

Bloch and Trager (1942:5) described language as "a system of arbitrary vocal symbols by means of which a social group cooperates". The oxfords advanced learner's dictionary? Define language as "the use by humans of a system of sounds and words to communicate". The chambers 21st century dictionary sees language as "any formalized system of communication, especially one that uses sounds or written symbols which the majority of a particular community will readily understand". Aitchison (1992:25), drawing from the definition of language given by Hockett (1963) itemized the various "design features" which characterized language, came up with ten features of language, which according to him capture the essential nature of language.

These features are use of the vocal-auditory channels, arbitrariness (which means there is no connection between a word and its symbols) semanticity (which refers to the use of symbols to refer to objects or action cultural transmission (that is , handing down language form one generation to another spontaneous usage (meaning initiation of speech freely and not under duress, turn – taking (this is, taking it in turns to speak, duality or double articulation (which refers to the organization of language into two "layers" such that b, o, y is meaningless unless when combined into a sequence such as boy, displacement (that is, the ability to refer to things far removed in time and place structure-dependence recognition of the patterned nature of language and manipulation of "structured chunks"), and creativity (which refers to the ability to produce an indefinite number of noble utterances).

Some of the above features according to Aitchison (1992:33) are common to both human and animal communication, while some are peculiar to humans alone. These are duality, displacement, structure-dependence, and creativity. Thus, the contention of Chomsky that "whatever evidence we do have seems to me to support the view that the ability to acquire and use language is a species-specific human capacity, that there are very deep and restrictive principles that determine the nature of human language and are rooted in the specific character of the human mind" as reported by Radford (1997:) is true.

2. LANGUAGE AND BRAIN

The resort to use of sign language to tech chimps how to communicate indicates an acceptance of the fact that apes are not physiologically conditioned for speech production. This followed the failed experiments with apes as Gua by professor and Mrs. Kellogs (1931) and Washoe by professor and Mrs. Gardener in 1966. But according to Aitchison (1992:51) some people have suggested that I is the brain-body ratio that matters as far as language is concerned. They content that high brain-body ratio means high intelligence, which in turn might be a pre-requisite for language. This argument seems plausible because the brain of an adult is said to be more that 2 % of his total weight while that of an adult chimp I said to be less than 1%. this was however, faulted through comparison of adult chimp and a human dwarf who all have the same brain-body ratio, but while a human dwarf speaks in somewhat limited fashion, the chimp does not. It is therefore agreed that the difference between human brain and the brains of animals is a qualitative and not a quantitative one.

Tarloy and Tarloy (1990:390) in their explanation of how the brain controls language process, provide the positions of three scholars in respect thereof. According to them, Geschwind (1979) proposed a simple model involving the classic language areas and their pathways as follows:

- A word is heard in the primary auditory cortex and then is sent to the Wernicke's area
- If a word is to be spoken, the neutral pattern is transmitted from Wernicke's area to Broca's area, where the articulator form is aroused and passed on the motor cortex that controls the movement of the muscles of speech.
- If the spoken word is to be spelled, the auditory pattern is passed on the angular gyms, where it elicits a visual pattern.

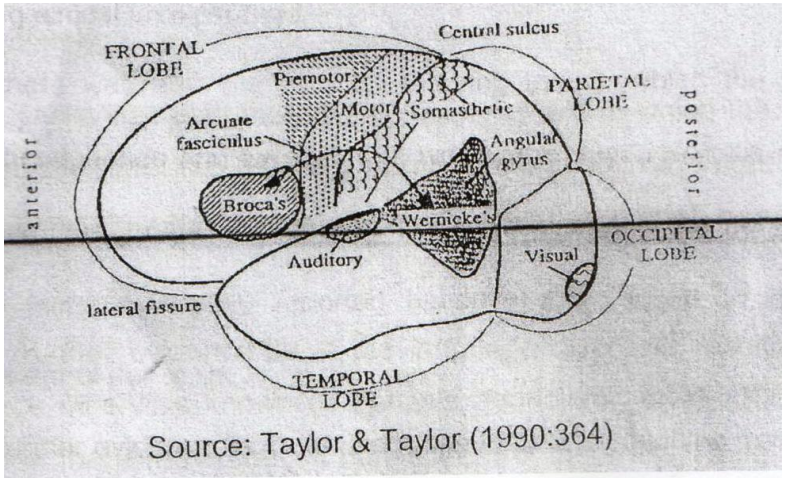
- When a word is read, the pattern in the visual cortices passes to the angular gyrus, which in turn arouses the corresponding auditory form of the word in Wernick's area.

This model, as Tarloy & Tarloy posit, involves connections only among different areas of the cortex and not sub-cortical structures. The (Crosson's Model (1985) as given below, involves such sub-cortical structures:

Language is formulated, segment by segment (word or phrase), in the anterior cortex. The formulated segment is sent, via the thalamus, to the temporo-parietal cortex for semantic monitoring. Motor programming is done in the interior cortex. The programmed segment is sent, via the arcuate fasiculus, to the temporo-parietal cortex for monitoring. Finally, the programmed segment is spoken when the temporo-parietal mechanism releases the caudet head of the basal ganglia from its normal inhibitory state. This cycle repeats for ach succeeding segment.

This model too, is said to give only a detailed account of speech production without giving a little account of language comprehension. The two models together are also concentrated to the left hemisphere, without involving the right hemisphere, which grant 91988) does a indicated by Tarloy & Tarloy (1990:391) thus:

> The RH appears to process a receptive lexicon that can be accessed by visual or auditory template matching. In spite of this RH lexicon, normal people tend to rely on the LH lexicon, perhaps because the LH inhibits the RH, or the LH completes the task before RH. The RH semantic ability may emerge when the LH is overloaded or when a verbal task involves imagery. The RH processes prosody and also provides a pragmatic and contextual frame in which the LH can do its analysis of language. But of course, it is the LH that has speech output, syntax and a bigger lexicon.



Source: Taylor & Taylor (1990:364)

Ultimately, it has become accepted that only humans are capable of using language and that the brain controls language. It is equally agreed that it is the left hemisphere, more than the right, which controls language. Further evidence in support of the abound. Aitchison (1992:52) report a postulation made in 1836 by MAFC Dax a Frenchman that paralysis of the right side of the body comes with loss of speech but this is not with paralysis of the left side, indicating that the left hemisphere of the brain, controls not only the right side of the body but speech too.

Another evidence is the Sodium amytal test development by Wada in 1949 in which a patient is asked to count aloud while Sodium amytal is injected into an artery that carried blood to one side of the brain. The patient experienced language difficulties if the side is the one responsible for speech while if it is not, the patient resumes normal counting almost immediately. There was also the dichotic listening test in language which the patient wears headphones and two different words are played language in the right ear is usually more accurately reported because it is linked to the left hemisphere of the brain.

Further evidence lies in the language disorders resulting from brain damage otherwise known as aphasia. Akmajian et al. (2001:542) are of the view that even in the left hemisphere of the brain. There is no equal or uniform representation of linguistic functions. They argue that damage to a small part of the hemisphere does not result in the impairment of all linguistic capabilities, but damage to different areas of the hemisphere lead to qualitatively distinct aphasia syndromes.

Similarly, even in the hemisphere, it is not the whole of it that is involved in speech. This is seen in the case of Phineas Gaga as reported by Aitchison (1992:57), Gaga had an accident in 1847 and

had a four-front iron bars embedded in the front left hand section of his head. It remained there for 20 years before he died, and although his personality changed for the worse his language was not affected.

Akmajian et al (2001:542) report that Paul Broca described a language disorder resulting from damage to the posterior part of the inferior frontal gyrus (also called Brosca's area) in 1861. The foremost symptoms of this ailment is the inability of the affected individual to speak fluently, so that a great effort is required to utter short halting phrases marked by the absence of function words. This type of aphasia is known as Broca's aphasia.

In 1874 according to Tarloy & Tarloy (1990:378) a German neurologist, Wernicke noted language impairment different from Broca's aphasia. This result indicates that to damage to the auditory association cortex of the temporal lobe, adjacent to the region that receives auditory stimuli. Its symptom includes impairment in the ability to understand spoken and written languages as well as speaking very rapidly what most of the time is meaningless.

Condition aphasia is another language disorder identified by Akmajian et al (2001: 545), which results from lesion in the teporo-parietal region that serves to synthesize meaning and form, affecting all venues of expression. Although there is fluency in spontaneous speech it is marked by the use of more words than is necessary and often inadequately structured.

The same authors also identified anomia as another language disorder in which the patient has difficulty in finding words, both during the flow of speech and in naming on confrontation. The area affected by lesion is dominant angular gyrus, the area thought to be necessary for the formation of association between the sensory modalities.

Finally, there is global aphasia in which, according to Taylor & Taylor (1990:379) all language and speech processes are severely impaired following lesion in the left hemisphere involving cortical and sub-cortical portion of the temporo lobe, frontal lobe and parietal lobe, all of which are nourished by the middle cerebral artery.

3. CONCLUSION

The preceding discussion shows that there is a strong relationship between language and brain. Human brain, particularly the left hemisphere, is responsible for the control of language, but the right hemisphere too, though talent can be activated if needed.

Also, he localization of language in the left hemisphere of the brain is a biological endowment of the human race, which no animal possesses, and it is the quality, not quantity of the brain that determines speech production, if not, Elephants, Whales and other large animals, which obviously have larger brain than humans, would become great users of language.

4. REFERENCES

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