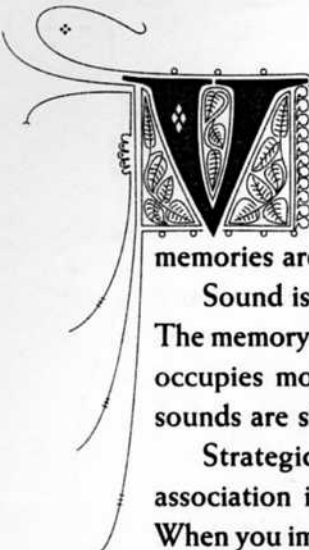




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Wernicke and Broca



Visual images are processed in the brain's visual cortex, located at the base of the skull, just above your spine. Immediately above the visual cortex, at the back of the cranium, is the visual association area, where visual memories are stored. (Stay with me, this gets interesting.)

Sound is processed in the auditory cortex, right above your ear. The memory of sound is stored in the auditory association area, which occupies most of the sides of your head. It's here that words and sounds are stored.

Strategically located where auditory association meets visual association is Wernicke's area, the spot where objects are named. When you imagine a golden, four-legged, African animal with irregular brown spots and an extremely long neck, it's Wernicke that attaches the word "giraffe" to the image. When you think of a famous landmark in Paris, a graceful metal structure known throughout the world, it's Wernicke that whispers, "Eiffel Tower, stupid." Wernicke is the king of nouns.



Wernicke's Area

Named for Carl Wernicke, the German neuropathologist who first described it in 1874, Wernicke's area appears to be crucial for language comprehension. People who suffer from neurophysiological damage to this area (called Wernicke's aphasia or fluent aphasia) are unable to understand content words while listening, and unable to produce meaningful sentences; their speech has grammatical structure but no meaning.

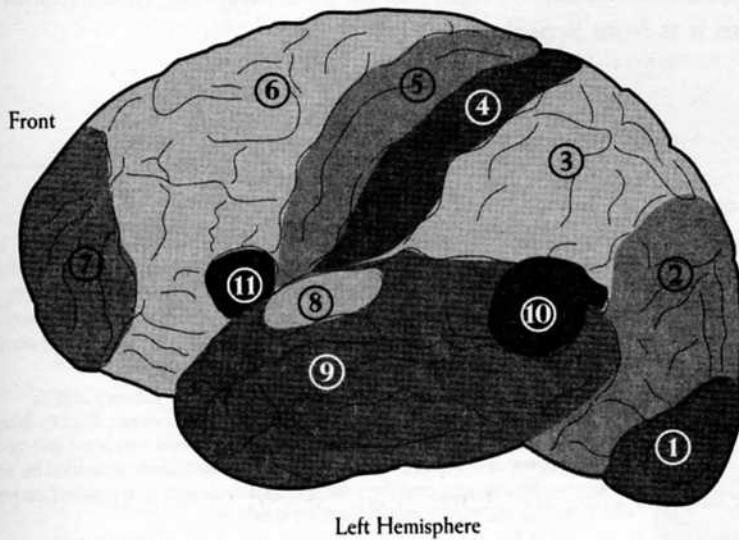
Auditory and speech information is transported from the auditory area to Wernicke's area for evaluation of significance of content words, then to Broca's area for analysis of syntax. In speech production, content words are selected by neural systems in Wernicke's area, grammatical refinements are added by neural systems in Broca's area, and then the information is sent to the motor cortex, which sets up the muscle movements for speaking.

Reference: Gray, Peter. *Psychology*. New York: Worth Publishing, 1994.



A Layman's Guide to the Brain

Were you aware that sight and sound are not only received by separate organs, but are stored and processed in totally separate areas of the brain? Did you know that more of the brain is devoted to sound than to sight? Does it surprise you to learn that the portion of the human brain that stores the memory of sound (9) touches more areas of the brain than any other? Notice the relative size and placement of the auditory association area (9), the auditory cortex (8), Broca's area (11), and Wernicke's area (10) compared with those areas designated for the storage and processing of sight (1 & 2).



1. Visual cortex: primary visual perception
2. Visual association area: complex processing of visual information
3. Sensory association area: processing of multisensorial information
4. Primary somatosensory cortex: pain, pressure, position, movement, and temperature
5. Primary motor cortex: initiation of voluntary movement
6. Motor association cortex: coordination of complex movements
7. Prefrontal cortex: planning, emotion, judgment
8. Auditory cortex: hearing
9. Auditory association area: complex processing of sound
10. Wernicke's area: comprehension of spoken language
11. Broca's area: speech production and articulation



At the other end of auditory association lies Broca's area, a powerful extension of auditory association into the motor association cortex. The motor association cortex is the center of all physical action and Broca's area the center of action words. Broca energetically generates verbs, enthusiastically constructs sentences, and anxiously anticipates what others are about to say.

The objective of advertising is to influence the prefrontal cortex — the seat of emotion, planning, and judgment, located just across the motor association cortex, right behind your forehead. And the shortest leap to it is from Broca's area.



Broca's Area

In 1861, French surgeon and anthropologist Paul Broca first identified the section of the brain, in the left hemisphere on the inferior border of the precentral gyrus, that is involved in speech production, specifically assessing syntax of words while listening, and comprehending structural complexity. People suffering from neurophysiological damage to Broca's area (called Broca's aphasia or nonfluent aphasia) are unable to understand and make grammatically complex sentences. Speech will consist almost entirely of content words.



Auditory and speech information is transported from the auditory area to Wernicke's area for evaluation of significance of content words, then to Broca's area for analysis of syntax. In speech production, content words are selected by neural systems in Wernicke's area, grammatical refinements are added by neural systems in Broca's area, and then the information is sent to the motor cortex, which sets up the muscle movements for speaking.

Noticing that Broca's area was nearly always located in the brain's left hemisphere, which is the dominant hemisphere in a right-handed person, Paul Broca originally suggested that a person's handedness* would be opposite his Broca's area, thus, a left-handed person would have a right-hemispheric language specialization. However, most left-handers also seem to have left-hemispheric language specialization, too. Tricky business, eh? Researchers are still trying to figure it all out.


* "Handedness" is a vague term. Researchers define handedness based on different theoretical assumptions; some define it as the hand that performs faster or more precisely on manual tests; others say it is the hand that one prefers to use, regardless of performance. Some researchers argue that there are two types of handedness: (a) either left or right, and (b) either right or non-right. Others think there should be a third category to include ambidexterity. Still others argue that handedness should not be lumped into two or three or five categories but measured along the scale of a continuum.

Reference: Gray, Peter. *Psychology*. New York: Worth Publishing, 1994.



Vision and vision words happen at the back of the skull; action and action words happen at the front, in Broca's area, right next to the prefrontal cortex. The ear is right in the middle, the key to everything.

Describe what you want the listener to see, and she will see it. Cause her to imagine taking the action you'd like her to take, and you've brought her much closer to taking the action. The secret of persuasion lies in our skillful use of action words. The magic of advertising is in the verbs.

Just ask Broca. 



Broca: The theater critic of the imagination; the part of the human mind that anticipates and ignores the predictable.