HACKERS TEST

READING PASSAGE

*You should spend about 20 minutes on **Questions 1-13**, which are based on Reading Passage below.*

The Speech Chain

An overview of the process through which communication is possible

It is possible to argue that the complexity and versatility of human language systems is what distinguishes us from other animals. Language is however a recent phenomenon in evolutionary terms, having arisen only over the last 200,000 years, and it is one that is grounded in basic biology. This biological basis is largely cognitive; studies of primates show no significant difference between them and humans in their anatomical capacity for speech. It is our cognitive capacity for language, working in conjunction with our physical apparatus for speaking and listening, that therefore distinguishes humanity.

The neurophysiological process for speaking and understanding is complex and requires multiple organs working in conjunction with our cognitive capacity. This process has been labelled the 'speech chain' and understanding how it works requires a combination of linguistics, cognitive science, biology and pragmatics, the study of how language is used to communicate. The speech chain describes the process by which a piece of speech is transmitted from the speaker to the listener, breaking it down into multiple stages which reveal the complex interplay of physical and cognitive processes involved.

The speech chain is useful for researchers who want to understand how the feedback between the brain, sensory nerves and sound waves, as well as the vocal cords and ear, can influence meaning and either enable or disrupt full understanding. Speech science, the experimental study of communication, focuses on the moment when language is a physical rather than mental process. Researchers involved in this field thus study the speech chain to determine how acoustic sounds relate to articulation and how speech sounds can vary in styles and emotions.

The speech chain itself describes the process which occurs when a message travels from the mind of a speaker to the mind of a listener. The process can be broken down into several stages, each of which occurs in a different part of either the speaker's or listener's head. It also occurs on a succession of levels which reflect the complex coordination of linguistic and biological processes that are incorporated into the chain. These levels include the linguistic level, the physiological level and the acoustic level, and an utterance must use all three to be successfully communicated.

The first step of the speech chain is the encoding of the message as a linguistic concept, which occurs in the brain. In this step the message must be put into a linguistic form and the

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pronunciation elements must be programmed correctly so that it is coherent. Following this encoding the appropriate instructions of the brain will travel along the motor nerves in the form of impulses before they reach the vocal organs, which include the lungs, vocal cords, tongue and lips. These will then enact the process of speech by collectively creating a sound wave; this noise generating part of the chain is also known as an aeroacoustic process.

The sound waves travel through the air, toward the listener, where they are picked up by their ears' hearing mechanisms and are translated into nerve impulses which travel towards their brain. Here they are decoded to establish meaning. The brain activity during this moment reveals recognition of the speaker's statement and the interpretation of these auditory sensations as pronunciation and meaning - if the message is understood. This establishes a connection between the speaker's brain and the listener's brain, which is the ultimate aim of the speech chain and is what enables communication.

There is one more step in the chain, which is the simultaneous transmission of sound waves to the speaker's ears from his or her vocal organs. This creates a feedback link which allows the speaker to check the coherence or accuracy of their own statement. This is fundamental to the process of communication since it allows the speaker to compare the quality of their expression with what they intended and make adjustments based on this feedback. The disruption to this feedback loop caused by deafness can have significant detrimental effects on the ability to speak coherently.

Overall this speech chain reveals the basis for speech and establishes a framework for the study of communication. Researchers continue to delve into how exactly the brain encodes meaning, and how the vocal organs are capable of creating sound waves, as well as the effect of feedback on the speech process. It is worth noting that whilst this process describes the cognitive and auditory basis for communication, there is also a very important visual element; facial gestures and bodily motions play a key part in the production of meaning. It is also worth remembering that the process illustrated in the speech chain happens almost instantaneously, or at least at the speed of sound, a fact that underlines the staggering complexity and capability of the human body.

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Questions 1-7

*Complete the summary using the list of words **A-I**, below.*

Researching the Speech Chain

Experts can utilise the speech chain to learn about feedback between the brain and other auditory factors. This feedback can be supportive of or disruptive to complete 1 ..... . They can also gain knowledge about the relationship of acoustic sounds to 2 ..... . The various stages of the speech chain happen on different levels that indicate the complicated 3 ..... of different processes. The final 4 ..... of the speech chain is to establish a connection between the brain of a speaker and listener. An additional phase involves the 5 ..... of sound between the speaker's vocal cords and ears. Feedback then lets the speaker make sure that his or her 6 ..... meets the intended quality. Overall, the speech chain is a fundamental aspect of biology which has allowed humankind to develop as a social, communicative species. It is this chain that is behind the foundation of speech, and it sets up the 7 ..... for communication research.

A	framework	B	coordination	C	sensation
D	transmission	E	aim	F	expression
G	articulation	H	perception	I	understanding

Questions 8-10

*Complete each sentence with the correct ending, **A-G**, below.*

8 The human differs from other primates because it

9 The breaking down of speech into stages

10 The visual component in the production of meaning

A	depends heavily on communicative feedback.
B	uses only the sensory nerves when communicating.
C	utilises a unique anatomical set of speech organs.
D	shows the interaction of cognitive and physical processes.
E	includes body movements and facial expressions.
F	has more than just a physical capacity for speech.
G	translates verbal signs into visual symbols.

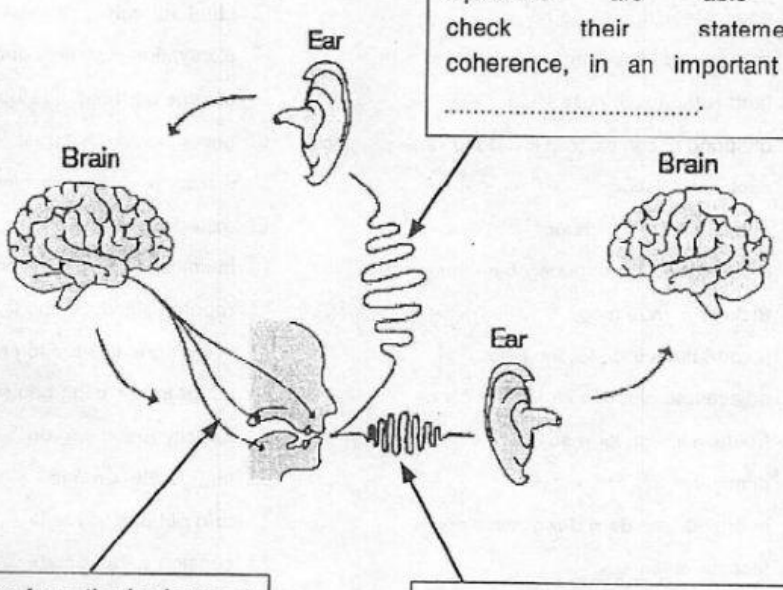
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Questions 11-13

Label the diagram.

*Choose **NO MORE THAN TWO WORDS** from the passage for each answer.*

The Speech Chain



Speakers are able to check their statement's coherence, in an important 13 .....

I he instructions from the brain travel along the 11 ..... before reaching the vocal organs.

The communication travels through the air as 12 ..... before reaching the listener's ear.

Đáp án - Dịch nghĩa - Chú giải trang 446

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