The Physical Adaptation Source

Instead of looking at types of sounds as the source of human speech, we can examine the types of physical features that humans possess, especially those that may have supported speech production. We can start with the observation that, at an early stage, our ancestors made a major transition to an upright posture with bipedal (on two feet) locomotion. This change significantly affected how we breathe. Among four-legged creatures, the rhythm of breathing is closely linked to the rhythm of walking, resulting in a one-pace-one-breath relationship. Among two-legged creatures, the rhythm of breathing is not tied to the rhythm of walking, allowing for long articulations on outgoing breath with short in-breaths. It has been calculated that human breathing while speaking is about 90% exhalation, with only about 10% of time reserved for quick in-breaths (Hurford, 2014, 83).

Other physical changes have been identified. The reconstructed vocal tract of a Neanderthal man from around 60,000 years ago suggests that some consonant-like sound distinctions were possible. Around 35,000 years ago, features in fossilized skeletal structures started to resemble those of modern humans. In the study of evolutionary development, certain physical features are streamlined versions of features found in other primates. While these features alone would not guarantee speech, they are strong indicators that a creature with such features probably has the capacity for speech.

Teeth and Lips

Human teeth are upright, not slanting outwards like those of apes, and they are roughly even in height. These characteristics, though not very useful for ripping or tearing food, seem better adapted for grinding and chewing. They are also very helpful in making sounds such as 'v.' Human lips have a much more intricate muscle interlacing than is found in other primates, and their resulting flexibility certainly aids in making sounds like 'p,' 'b,' and 'm.' In fact, the 'b' and 'm' sounds are the most widely attested in the vocalizations made by human infants during their first year, regardless of the language their parents are using.

Mouth and Tongue

The human mouth is relatively small compared to other primates and can be opened and closed rapidly. It is also part of an extended vocal tract that has more of an L-shape than the straight path from front to back in other mammals. In contrast to the fairly thin flat tongue of other large primates, humans have a shorter, thicker, and more muscular tongue that can be used to shape a wide variety of sounds inside the oral cavity.

Additionally, unlike other primates, humans can close off the airway through the nose to create more air pressure in the mouth. The overall effect of these small differences taken together is a face with more intricate muscle interlacing in the lips and mouth, capable of a wider range of shapes and more rapid and powerful delivery of sounds produced through these different shapes.

Larynx and Pharynx

The human larynx or "voice box" (containing the vocal folds) differs significantly in position from the larynx of other primates such as monkeys. In the course of human physical development, assuming an upright posture moved the head more directly above the spinal column, causing the larynx to drop to a lower position. This created a longer cavity called the pharynx, above the vocal folds, which acts as a resonator for increased range and clarity of the sounds produced via the larynx. Other primates have almost no pharynx. One unfortunate consequence of this development is that the lower position of the human larynx makes it more possible for humans to choke on pieces of food. Monkeys may not be able to use their larynx to produce speech sounds, but they do not suffer from the problem of getting food stuck in their windpipe. In evolutionary terms, there must have been a significant advantage in gaining this extra vocal power (i.e., a larger range of sounds) to outweigh the potential disadvantage from an increased risk of choking to death.