

The human face: unique in the entire animal kingdom

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The human face design is reviewed, focusing on its complex anatomy and physiology that allows effective communication of a wide variety of emotions. The human face traits are then contrasted with those of the higher primates to document the fact that numerous major differences exist between the two. This accounts for the effectiveness of human facial communication in contrast to the very limited ability of chimps to express emotion by their faces. Last, a review of Darwin's theory of the evolution of the human ability to convey numerous emotions by their facial neuromuscular system was reviewed. It is noted that many scholars in this area have rejected Darwin's theory and have proposed alternative evolutionary theories. It was concluded that evolution does not explain the origin of the system, only design does, often the theory of overdesign.

A major way that humans communicate—for example, by smiles, looks of sadness or joy—is the face. This is possible due to facial neuromuscular components that are far more complex than in any other animal, even our putative closest relatives, the higher apes. In contrast to other mammals, including all primates, the human face is able to effectively convey an enormous range of feelings and emotions. For this reason, the human face is often referred to as the window to the soul. It has been called the epitome of beauty, as illustrated by Christopher Marlowe's reference, in *Doctor Faustus*, to Helen of Troy as “the face that launched a thousand ships”.

Human facial expressions are controlled by 55 muscles, including eye movements, which are controlled by six muscles, and the eyelids, controlled by a pair of muscles (figure 1). Facial muscles exist in every part of the face, including the jaw, scalp, cheek, eyelids, tongue, forehead, lips, nose, and around the mouth and eyes. Some muscles even control our ear auricle movement. About half of all facial muscles are required for various practical tasks, including eating, speaking, and closing the eyes. However, the other 20 or so are designed exclusively to produce facial expressions, a number which no other animal is even close to boasting.¹ A sharp contrast even exists in the neuromuscular control of human cheek muscles and those of chimps, which evolutionists claim are our closest cousins.

In addition, the neck muscles and those that control speech, including the tongue and the larynx, are also critical in conveying human feelings, both for complementing and reinforcing facial expressions. Thus, a design argument exists behind the genetic variation that produces the large number of human facial expressions, which reflect emotions. Lastly, the bone and cartilage structure, plus the soft tissue, fat, and skin, and even the eyebrows, all help make complex human

facial expressions possible. Furthermore, among all animals, humans alone have a chin at the bottom fourth of the face.²

In contrast to humans, apes have a single enormous cheek muscle pair that controls their powerful jaws, which are designed for chewing.³ The human cheek muscles, although much smaller in size, are greater in number and are designed to produce a large number of effective facial communications.⁴ For example, ape cheek muscles are incapable of producing a human-like smile. Some ape–human similarities exist, of course, but numerous major contrasts also exist.⁵

The fact that humans are bipedal facilitates facial communication. The normal mode of human locomotion is upright, allowing them to effectively communicate facial expressions face to face.⁶ Quadrupedal locomotion makes it far more difficult for mammals to communicate by facial gestures because their normal walking and standing postures involve looking at the ground.

Universal facial expressions

As noted, “facial expressions come from numerous, well-designed muscles that are unique to the human face”.⁷ It is estimated that humans can make and discern 10,000 different facial expressions, and many of these are universally found in all cultures, indicating that they are a built-in, designed means of communication.⁸ The variety of facial expressions is illustrated by psychologist John Liggett, who was able to form hundreds of artificial facial expressions based on the numerous structures unique to the human face.⁹

In contrast, apes can convey, at most, less than a dozen facial expressions.¹⁰ Because most human facial expressions are not required for survival, Burgess concluded that this ability in humans is evidence of overdesign. He writes that

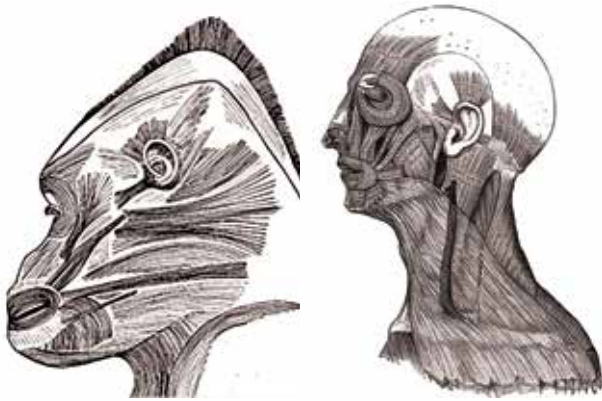


Figure 1. Human and ape facial muscles

the facial expression ability is critical for effective human communication and quality relationships, noting that humans “constantly observe and react to the facial expressions of others around them”, even though they often merely respond intuitively, with little thought. For example, when “a person sees someone looking worried, they often ask what is wrong, and when they see someone smiling, they often smile in response”.¹¹

The lip muscles are also important in achieving effective communication. Examples include pursing one’s lips, licking them, or pressing them together, which generally indicates anger or frustration. The mouth can also convey a wide variety of information ranging from fear to concern, anger, affection, and determination.¹² A big smile that flashes one’s teeth conveys friendship and acceptance. This trait is unique to humans and its origin remains a puzzle to evolutionists,¹³ especially in view of the fact that in “almost all other species, especially primates, baring one’s teeth is a threat or a show of potential force”; the opposite of its role in humans.¹⁴

The nasolabial folds, commonly known as smile lines, are facial features that are important in producing many human facial expressions. They consist of two skin folds that run from each side of the nose to the mouth corners. They are defined by facial structures that support the buccal fat pad which separate the cheeks from the upper lip. The term ‘nasolabial’ derives from the Latin *nasus* for ‘nose’ and *labium* for ‘lip’.

Even when a person is trying not to reveal their feelings via facial expressions, micro-expressions occur; a trait not existing in any primate. Micro-expressions are very brief, involuntary facial expressions that help to reveal one’s inner emotions. Actually, the face is often the best indicator of a person’s emotions. Unlike canned facial expressions, such as the so-called fake smile that we produce as actors or to mislead someone, it is very difficult to fake micro-expressions.¹⁵

Speech production

Speech production “is one of the most complex and rapid motor behaviors and involves a precise coordination of over 100 laryngeal, orofacial and respiratory muscles”. In spite of decades of research, the human speech system is so complex that we still “lack a complete understanding of laryngeal motor cortical control during the production of speech and other voluntary laryngeal behaviors”.¹⁶ An important adjunct to effect speech communication are facial cues, which often occur as soon as $\frac{1}{15}$ to $\frac{1}{25}$ of a second after words are spoken.

Charles Darwin recognized that facial “expressions give vividness and energy to our spoken word. They reveal the thoughts and intentions to others more truly than do words, which may be falsified.”¹⁹ Darwin wrote in his 1872 book *The Expression of the Emotions in Man and Animals* that many facial expressions are universal, not learned, but biologically determined, and he attempted to argue that these were the result of evolution.¹⁷ A problem with his theory is Darwin “formulated his mechanisms of expression *before* collecting data on expressions” and tended to see what he was looking for to support his theory.¹⁸ A major problem is that Darwin’s work “was not a dispassionate evolutionary work, but a tactical blow against creationist accounts of facial expression”.¹⁹ Many contemporary evolutionists have rejected Darwin’s conclusion, which relied on Lamarckian inheritance of acquired characteristics and the vestiges theory.

Modern theory instead emphasizes natural selection, adaptation and function in the evolution of facial expression.²⁰ As one of the leading evolutionary researchers opines, the origin of facial displays is purely due to specific selection pressures. They co-evolve with others’ responses to them, a theory he calls the Behavioral Ecology view.²¹ Other theories of the evolution of facial expression also exist, all which are problematic because they depend on the existence of the complex neuromuscular system that allows the enormous combination of facial variations to exist.

In a summary of Darwin’s work, Landau wrote that “the expressions of the face are in large measure universal and innate”.²² Landau and others have researched facial expressions across the world, concluding that “all members of the human species share the same expressions for signaling the basic human emotions”.²³ This finding unites all humans and contrasts us with all of the primates.

Facial expression universals

Pioneering research on facial expression universals was carried out by psychologist Paul Ekman in the 1960s. His team presented photos of faces showing different emotional states to test subjects. The test subjects then, by using a list of possible emotions, classified the emotional states that

they perceived in each photo. Ekman and other researchers have determined that the face can convey seven basic core emotions, which are now known to be universal.²⁴ They are:

1. *Joy* or happiness shown by raising the mouth corners to produce a smile, and a tightening of the eyelids.
2. *Surprise* symbolized by raising the eyebrows, opening eyes wide to expose the eye whites and dropping the jaw slightly.
3. *Sadness* symbolized by lowering the mouth corners, descending the eyebrows to the inner corners, and drooping the eyelids.
4. *Anger* shown by lowering the eyebrows, pressing the lips firmly together and the eyes slightly bulging.
5. *Disgust* symbolized by raising the upper lip, and wrinkling the nose bridge and cheeks.
6. *Fear* shown by raising the upper eyelids, opening the eyes wide and stretching the lips horizontally.
7. *Contempt* symbolized by tightening up half of the upper lip using the risorius muscle, and often tilting the head slightly back.²⁵

These facial expressions have been called the “universal language of emotion”. Blends of these basic seven exist, even of contradictory emotions, such as happiness and surprise.²⁶ These blends are shaped by our culture, contributing to the cultural diversity existing in humans today.²⁷

The whites of the eyes

The whites (sclera) of human eyes are clearly seen when the eyes are open. In contrast, in all apes, the white sclera is not normally visible. The eye sclera can be used by humans to emphasize certain emotions, such as surprise, which is expressed when the eyelids are opened wide to reveal the large white areas. In contrast, when the eyelids are slightly closed, such as during concentration or disdain, they cover much of the sclera. The sclera also makes it possible to see the eye pupil, which makes it easy to determine when the eyeball is moved downward, upward, or rolled. An example is the so-called rolling of the eyes as an expression of annoyance or disrespect.

The visible sclera also allows one to notice the direction of a person’s gaze and therefore easily determine if someone is looking directly at you, even when they are 20 or more feet away from you. In contrast, it

can be difficult to determine for sure if an animal is looking directly at you, even when it is as close as ten feet away. This is why making and maintaining eye contact is critical when communicating with someone. The whites of the eyes are a particular challenge to evolution because they are unique to humans. Even the primates that evolutionists believe are closest to our evolutionary ancestors lack this trait.

The homunculus

A good illustration of the enormous brain power required to display facial emotions is a drawing called the cortex homunculus (figure 2).²⁸ The homunculus is an illustration used to show the relative fraction of the cortex used for various body functions. The cortical homunculus is a neurological map of the anatomical divisions of the body. The two types of cortical homunculi are the sensory and motor. It was found that the face uses the largest part of the entire cortex, and the hand is the second largest part shown in the cortex homunculus.

The same pattern is more valid of the somatosensory cortex, of which the face takes up almost half of this diagram. This illustration, found in many anatomy and psychology books, is based on the research work of Canadian neurosurgeon Wilder Penfield and was first published in 1937.²⁹

The face for identification

The human face is also a major way humans identify not only individuals but ethnic groups, sexes, races and other people groups.³⁰ One of the main ways we identify the age of persons, from infant, child, adolescent, young adult, middle age, and old age is also the face.³¹ It is also the major way that we recognize other people ranging from our family to friends. Many animals use body size and smell as a far more important means of recognizing others, as anyone who owns a dog is very aware.

Unfortunately, the face has also played a major role in the long attempt to rank the human races from highest to lowest based on the idea that facial expressions slowly change the facial structure.³² Gerasimov even claims that he can judge the personality of long-dead men by their facial traits.³³ An example is that, after years, a scowl and

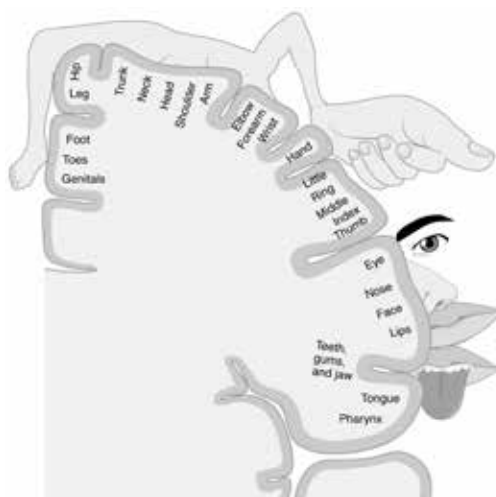


Figure 2. A cortical sensory homunculus

smoking due to pursing the lips to draw in smoke alters how the face looks.

Summary

As Landau wrote, the “human face is one of the most fascinating of all images: powerful, purposeful, personal”.³⁴ Human facial expression requires integration of both the skeleto-muscular and integumentary systems to effectively function.

The face is a highly effective and important means of human communication involving the integrated function of numerous organ systems and distinguishing humans from all other life forms including our putative closest relatives, the chimps.

The orthodox Darwinian view is that chimps and humans have a common ancestor, but scientists have not been able to explain the many profound differences between them, including the structure and function of the face.³⁵ The fact is, the human face does not closely “resemble those of apes or any other animal”.³⁶ Furthermore, the evolution of facial expression, as with all social behaviour, is “fraught with just-soism”.³⁷

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