



**DEVELOPMENT AND EVOLUTION OF FACIAL MUSCULATURE AND FACIAL EXPRESSION**

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**ABSTRACT**

Facial muscles are a group of subcutaneous striated skeletal muscles that control facial expression. Generally they originate from the external surface of the skull bone or sometimes from fascia and inserts into the skin of the face. When they contract, the facial skin moves because of the underlying attachment. There are several facial muscles which produce different facial expressions at different situations depending on the need. Each facial muscle produces specific expression solely or in group. This peculiarity of facial muscles and the facial expressions are seen mostly in mammals and had evolved greatly in humans. This review focuses to associate the development with evolution of facial musculature and facial expressions.

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**INTRODUCTION**

Evolutionary developmental biology compares the developmental processes of different organisms to infer ancestral relationships between them and how the developmental process evolved. Facial expressions are a type of close non-vocal communication that is used by primates and produced by facial musculature. They play a prominent part in human reproduction. Facial expressions take on a significant role where it indicates character, gives beauty and most importantly interest to the human countenance. It gives every person his or her unique individuality where every face will differ. Each race has its characteristic "face" and numerous animals are proficient of much facial expression. Gerald E. Huber has premeditated the anatomic mechanism that produces this expression. He has been especially interested in its evolution, its development during childhood, and racial changes in it. It evolves in the mammals from two superficial neck muscles, both visceral in origin: the platysma (originally nuchal in position) and the sphincter colli profundus.

Primates are known to make the most complex facial displays and have the most complex facial musculatures when compared to other mammals. In the past there were various ideas of primate mimetic musculature. This involved the function of the facial displays and the evolution behind it. The

ideas in the past were known to essentially be linear "scala natural" models where it increased its complexity. When looking at primates, they are highly social animals when compared to other mammals. The environments which primates are brought up in are in the social setting for most, if not all, of the individual's life. There is a wide range of social groups in primates from size to over hundreds to few as two - three individuals. When it comes to large species, there are differences in the permanency and the composition. In the setting that the group is surrounded by is where the individuals development, maturation and the early learning takes place [1].

The mammalian facial muscles are a subgroup of hyoid muscles (i.e. muscles innervated by cranial nerve VII), which are usually attached freely to the movable skin; all in all is responsible for facial expressions. Within the numerous years of development in the scientific field, Diogo *et al.*, reported in 2008 where they gathered results of their long-term study of comparative anatomy, homologies and evolution of the head and neck muscles of sarcopterygians (group comprising tetrapods and bony fish such as coelacanth and dipnoans). He and his research team mainly targeted their study on dissection of numerous non-primate sarcopterygians and a few other primates. Their ultimate goal was to present the homologies and evolution of the different muscles which include the hypobranchial, branchial, mandibular and the hyoid muscles of the sarcopterygii as a whole. [2]

As everyone knows, reading and interpreting microexpressions (involuntary facial expression that is shown on the persons face according to their emotions that are experienced) is an fundamental part of understanding

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nonverbal behavior and physically reading people. When studying about microexpressions, there are a total of seven universal micro expression, which are sadness, happiness, fear, anger, surprise, contempt, and disgust. These emotions often occur within short time intervals as fast as 0.0666 (1/15) to 0.04 (1/25) of a second. [4]

There are many researchers who spend countless number of years of their research period in life dedicated to reading microexpression. Dr. Paul Ekman, American psychologist who served as a scientific advisor for the show Lie to me by analyzing and critiquing each episode's script, has done extraordinary research on decoding the human face. His research has shown that facial expressions are universal. One of Dr. Paul Ekman's research/study paper explains the comparasion between two groups of people, one group of from the United States and the other from Papa New Guinea. Papa New Guinea is in southwesten pacific, in the eastern half of New Guinea and its offshore island, where megority of the people have never seen TV or movies. They were taken into the study and Dr. Paul Ekman realized that both people from the United States and the people in Papa New Guinea make the same face for sadness and other emotions. His curiosity had taken him to the next level towards the bind. He found that congenitally blind individuals, those individuals who are blind since birth, also portray the same expression even though they have never seen other people's faces. The seven facial expressions (mentioned above) are said to be the most commonly used and easy to interpret according to Dr. Paul Ekman. [5]

Learning to read facial expressions are exceptionally helpful for understanding peoples lives. It gives the ability to understand the emotions of people and will all in all assist with a deeper communication level. [6]

## References

1. "The Facial Expression Musculature in Primates and Its Evolutionary Significance." Burrows - 2008 - BioEssays - Wiley Online Library. N.p., n.d. Web. 15 Feb. 2017.
2. Diogo, R., B. A. Wood, M. A. Aziz, and A. Burrows. "On the Origin, Homologies and Evolution of Primate Facial Muscles, with a Particular Focus on Hominoids and a Suggested Unifying Nomenclature for the Facial Muscles of the Mammalia." *Journal of Anatomy*. Blackwell Science Inc, Sept. 2009. Web. 15 Feb. 2017.
3. "Evolution of Facial Musculature and Facial Expression." The JAMA Network. N.p., 19 Mar. 1932. Web. 15 Feb. 2017.
4. "Paul Ekman Group." Paul Ekman Group, LLC. N.p., n.d. Web. 16 Feb. 2017.
5. "Guide to Reading Microexpressions." Science of People. N.p., 14 Dec. 2016. Web. 16 Feb. 2017.
6. Pardon Our Interruption. N.p., n.d. Web. 17 Feb. 2017.

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