

**Indian Institute of Technology Kanpur**  
**National Programme on Technology Enhanced Learning (NPTEL)**  
**Course Title**  
**A Brief Introduction of Psychology**

**Lecture – 23**  
**Emotion**

**by**  
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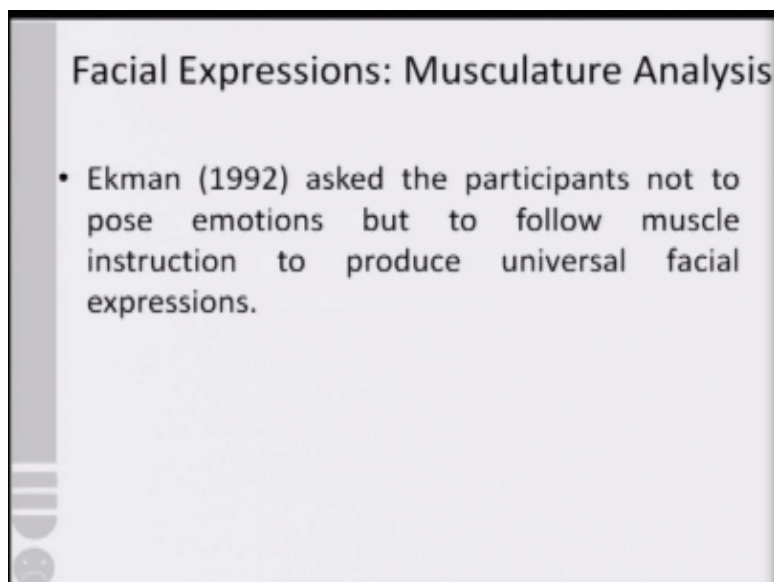
In the previous lecture we saw that the muscle of the face it plays an important role, and it gives know, a feedback to us as human beings to derive our subjective experience. In our day-to-day life we see a whole lot of expressions and this vey lecture would be exclusively dedicated to those type of expressions okay, some of it which is now especially customized to make you understand things, and some of it which has been borrowed from real-life our sources. Look at this very video.

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See love on her face, Valour, Grief, Honour, Wonder, Fear, Revulsion, Anger, Tranquility. Now in this very video you realize that there was a trained artist okay, she was known required to show the given emotion on the face, and there was very pronounced change, you know in terms of the muscles of the face okay. And this tells you that, if you start making the musculature analysis of the face you would come across a fantastic area of research all together. Now Paul Ekman, he took a set of participants and asked them to pose known emotions.

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But he did not know, name the emotion that the individual had to pose rather he asked the participants only to follow the instructions to move the muscles okay. Now universal facial expressions were derived not by asking the participants to pose an emotion, but by asking them simply to follow the muscle movement instruction.

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Look at this very image, the image that you see right now, it tells you how different muscles are spread throughout our face, and it is basically the movement of these muscles on the face, that is held responsible for know, adding whatever expression is visible on the surface of the face okay.

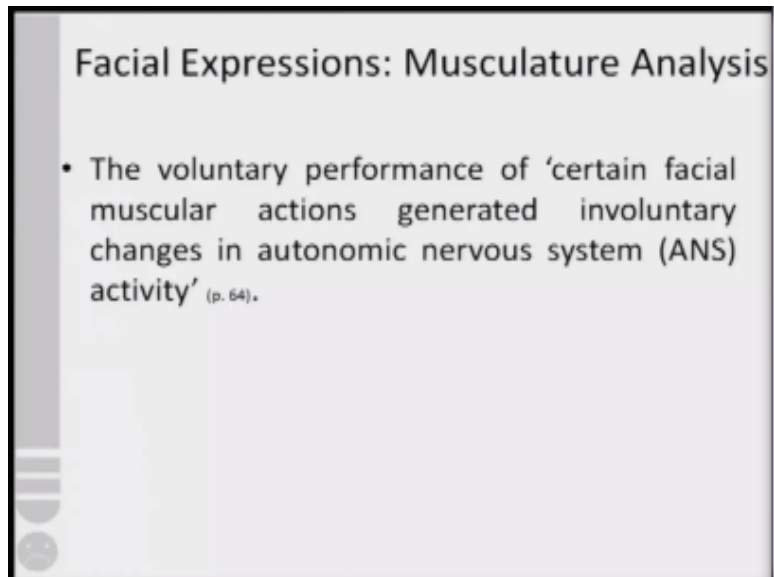
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Now in this very example what Ekman tries doing was that what we saw till now was an emotion is there, you experience it, you express it, somebody recognizes it, in this case he wanted the participants just to follow the instruction. So if I ask know, you have to make your lips move apart that is it, there is no other expression okay. And then he tried to make out, that how is it that the movement of these muscles they actually are responsible not only for say, making the world understand your expressions.

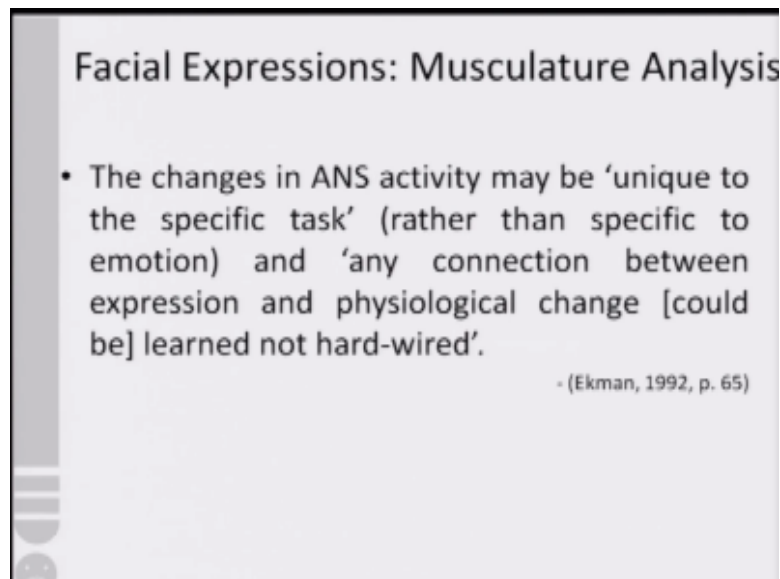
But he said that the subjective experience that you have, that also can be affected by it. And I must say that I am thankful to my colleague professor Satyaki Roy who agreed for this photo session. So you will see a whole lot of photographs okay, where he has posed for certain emotions.

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Now I am quoting Ekman who said that the voluntary performance of certain facial muscular actions generated involuntary changes in the autonomic nervous system activities okay.

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And the changes in the ANS activity may be unique to a specific task rather than specific to emotion and any connection between expression and physiological changes could be learned and it is not hard-weird okay. Now we saw in the previous lecture that the left side of the face had a little pronounced expression compared to the right side of the face okay. And based on the musculature analysis also it has been found that the left side of the face is more intense in terms of exhibiting the expression.

So right from musculature analysis as well as the behavioral analysis, behavioral measures that has been taken in both the cases it has been uniformly -- it has been observed that the left side of the face is more pronounced. Now we will not go into the details, but just to mention to you that there are now coding system know, there are software, there are specialized programs which are specifically designed to know, understand the musculature analysis.

First one is the FACS, the facial action coding system okay, which came forward in 1978, and Ekman and Friesen they are the one who gets the credit for it, the second is the MAX, the maximally discriminative facial moving cooling system by Izard. And then the FEAT facial expression analysis tool okay so now if you look now another one or two most systems have

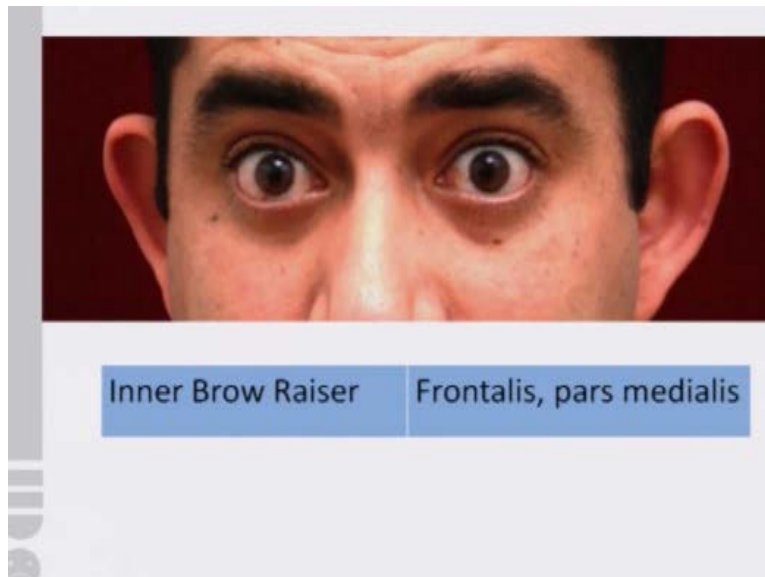
come into being okay and people are trying their best right from the computer generated analysis software assisted analyses to pure behavioral measure to physiological measure. Changes in the ANS activities to understand emotion now look at this vary face okay.

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You see the expression under standard that we would be looking at a whole lot of faces and our attempt is to understand the facial expression with respect to musculature analysis.

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Now the expression was very destined because you look at the eyes okay.

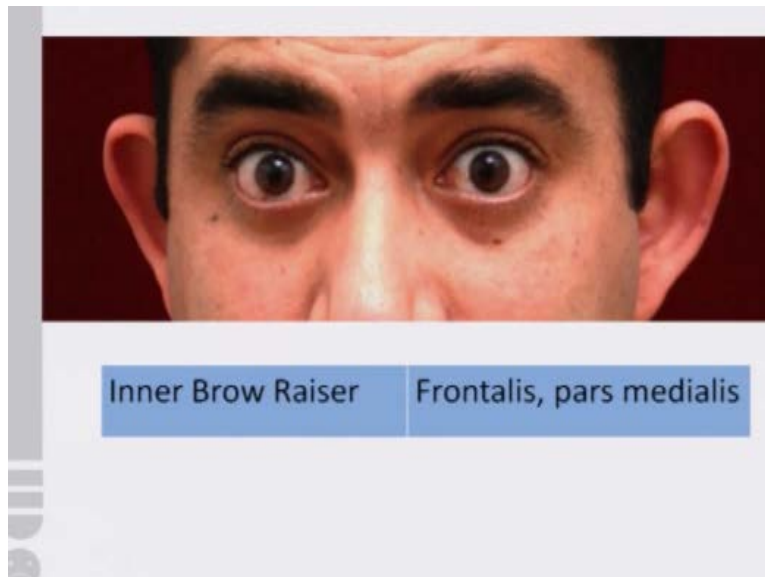


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This was the most dominant feature here on the face.

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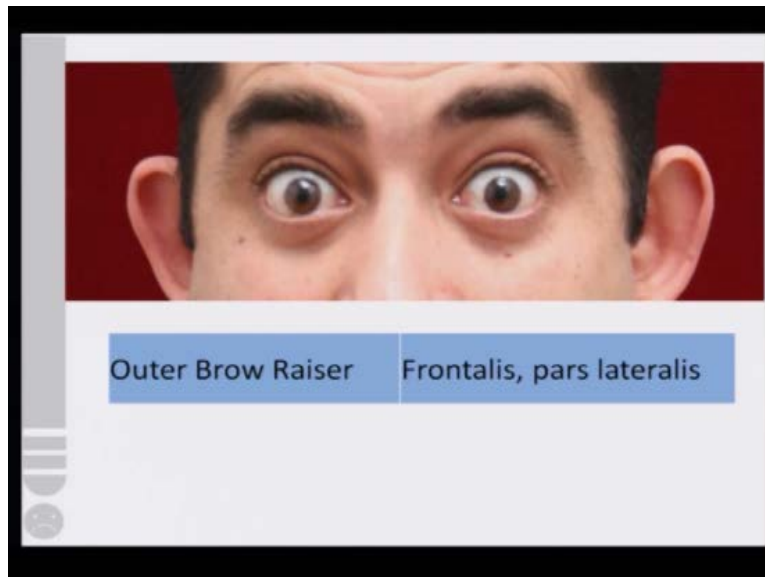
So what you saw that the inner eyebrows they were raised okay and then on the right side you find Frontalis and the pars medialis the two muscles which are basically responsible now for no raising the inner brow.

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You have the other expression now okay.

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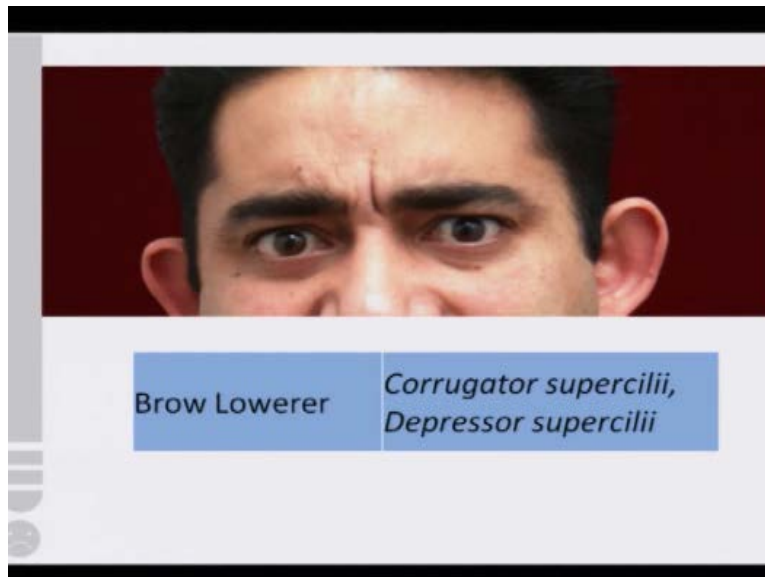
And then you realize that there is an older brow movement an outer brow raise an again now it is Frontalis and pars lateralis from these two muscles which are responsible for this type of for movement.

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You see anger and then you see.

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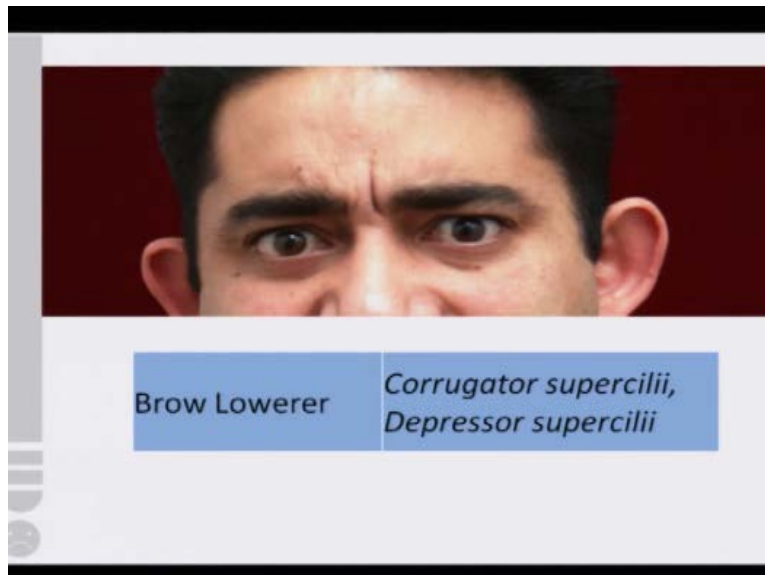
That the brow as been lowered now okay now supercili muscle the corrugators and the depressor they are the one which are responsible for lowering down the eye brows okay and then in the first two cases you saw surprised now you see.

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You see anger.

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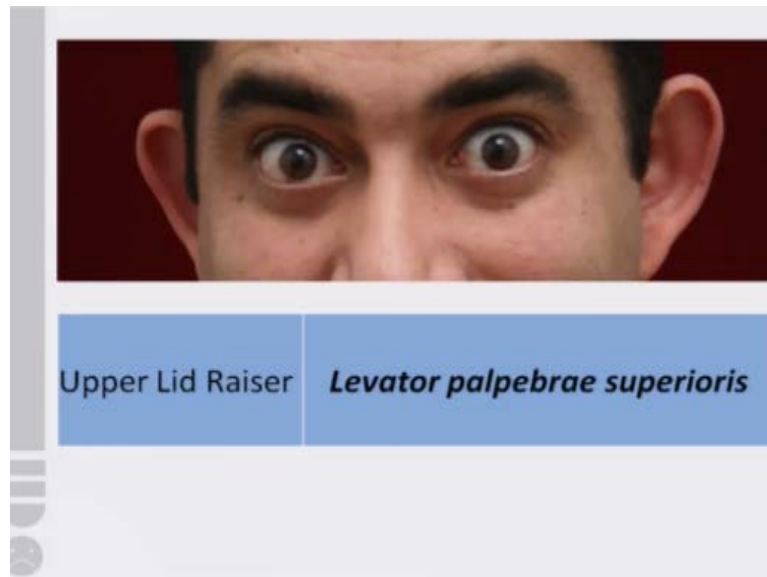




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You see another expression now okay now it is not only the eyebrows it is also the lips which gives you now the impression of emotion.

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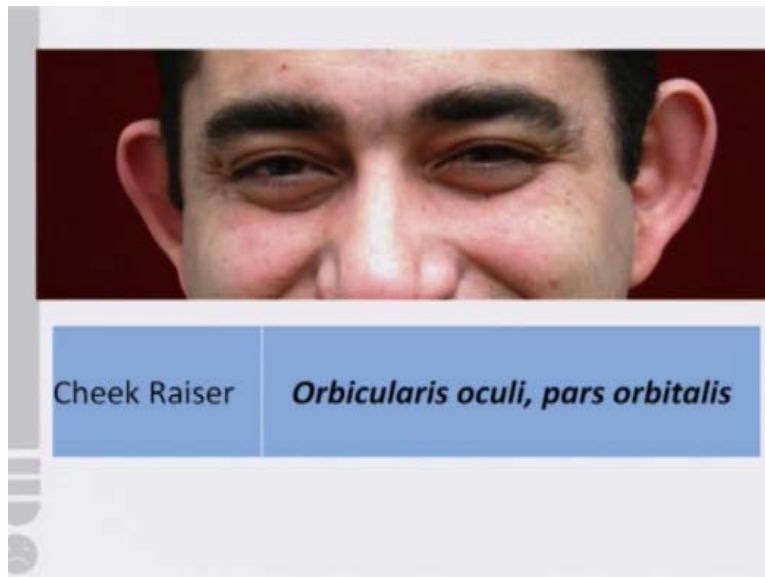
Now you have the upper lid raiser.

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Another emotional expression.

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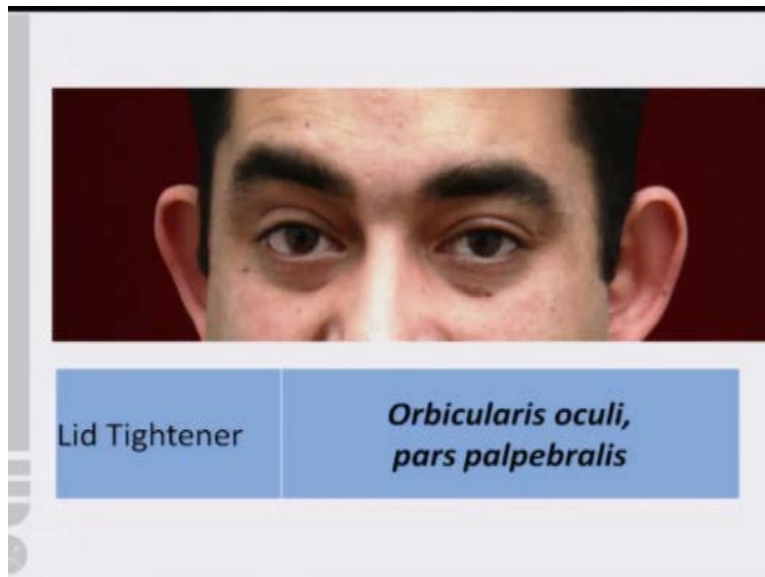
And then you have the cheek raiser now it is orbicularis oculi muscle and the pars orbitalis muscle which are responsible for this movement.

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You see disgust on the face.

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And then you have lid tightened here.

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Disgusted of extreme order.

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And then you say the that the wrinkle has actually no made the image very, very destined.



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Another emotion change in the expression.

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|                        |                                     |                                                                                    |
|------------------------|-------------------------------------|------------------------------------------------------------------------------------|
| Upper Lip<br>Raiser    | <i>Levator labii<br/>superioris</i> |  |
| Nasolabial<br>Deepener | <i>Zygomaticus<br/>minor</i>        |  |
| Lip Corner<br>Puller   | <i>Zygomaticus<br/>major</i>        |  |
| Cheek<br>Puffer        | <i>Levator anguli<br/>oris</i>      |  |

Now you saw the upper lip raiser you saw the deepener again the lip puller and the cheek puffer okay and these were now different muscle movements which led to changes in the expression.

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Look at the changes in the lip movement now.

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|                      |                                      |                                                                                    |
|----------------------|--------------------------------------|------------------------------------------------------------------------------------|
| Dimpler              | <i>Buccinatorb 40</i>                |  |
| Lip Corner Depressor | <i>Depressor anguli oris 41</i>      |  |
| Lower Lip Depressor  | <i>Depressor labii inferioris 37</i> |  |
| Chin Raiser          | <i>Mentalis 43</i>                   |  |

And then you realize the dimpler the lip corner depressor the lower lip depressor and the chin raiser okay they know different activities and have been performed okay and these expressions are distinctly visible because specific muscles have now moved.

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Look at the changes now this is what we see in our day-to-day life.

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|               |                                                                    |                                                                                    |
|---------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Lip Puckerer  | <i>Incisivii labii superioris &amp; Incisivii labii inferioris</i> |  |
| Lip stretcher | <i>Risorius w/ platysma</i>                                        |  |
| Lip Funneler  | <i>Orbicularis oris</i>                                            |  |
| Lip Tightener | <i>Orbicularis oris</i>                                            |  |

Okay now you have the Lip puckerer, lip stretcher, the lip funneler and the lip tightener okay and based on now the movement of the muscle the expression on the lips and area close to the lips that changes.

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Look at the change in expression now.



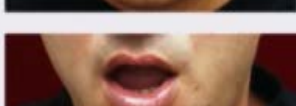
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|               |                                                                                  |                                                                                    |
|---------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Lip Pressor   | <i>Orbicularis oris</i>                                                          |  |
| Lips part     | <i>Depressor labii inferioris or relaxation of Mentalis, or Orbicularis oris</i> |  |
| Jaw Drop      | <i>Masseter, relaxed Temporalis &amp; internal Pterygoid</i>                     |  |
| Mouth Stretch | <i>Pterygoids, Digastric</i>                                                     |  |

So you have the lip pressor, the lip part, the jaw drop and the mouth stretch again intensity of the expression varies because certain muscles have no moved in a little differently we have exclusively focused ourselves on human expression you would be surprised to know that whole lot of research is going on in the area of development of humanoid robots and Takanishi Lab in Japan they have come forward with the humanoid robots okay which can express liek human beings and this entire development of humanoid robot is based on human facial expression look at this video.

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What we have seen till now was no posed emotions by one of my colleague's and then no Robotic expression from the initial Lab, look at the images on your screen now.

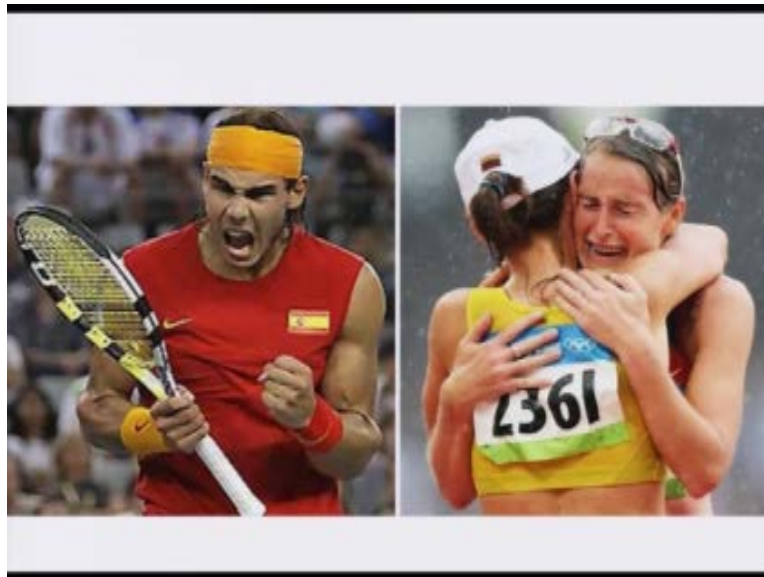
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These are real life expressions from two a very renowned sports person of India, when you look at them in action, okay. What do you see? What is there on the face? Okay. Is it that an athletic is going to make a jump and this is a extremely distrustful activity, is it the anticipatory target that she visualizes she would be able to achieve, okay. That has no added to the expression on the face. In the case of the tennis player is it the joy, okay.

Is it know that pride, the sense that you have defeated somebody, okay. These are very interesting things in life to observe.

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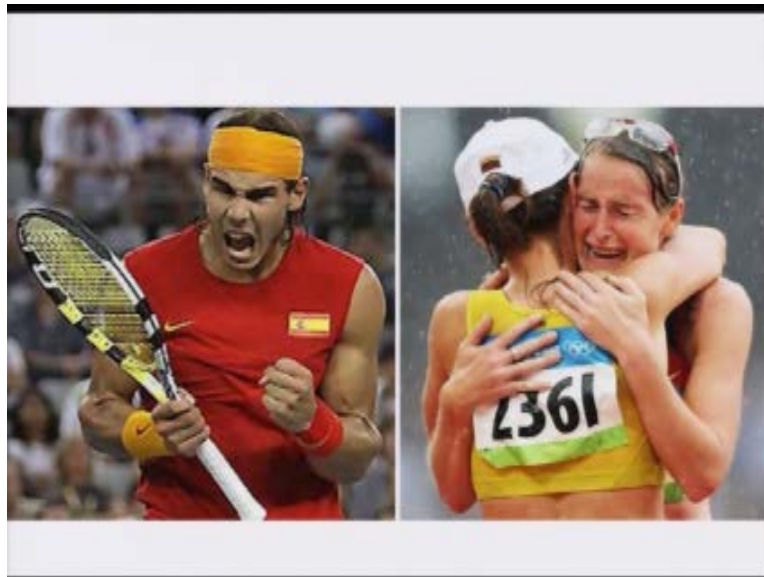
Look at these two expressions, okay, first look at know, the tennis player.

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And you see in the previous case the tennis player had won the match and what was the expression.

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And in this case you see the tennis player, okay. And his expression, look at the two women athletics there no, can you make out whether they have won the game therefore their no emotional they have lost and therefore they are emotional, okay. From the field of sports you would realize whole lot of no expressions where establishing the distinction Is extremely difficult.



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Look at the Indian wrestler Sushil Kumar no, in the Olympics when he was given the Medal, okay. How mesmerized he was.

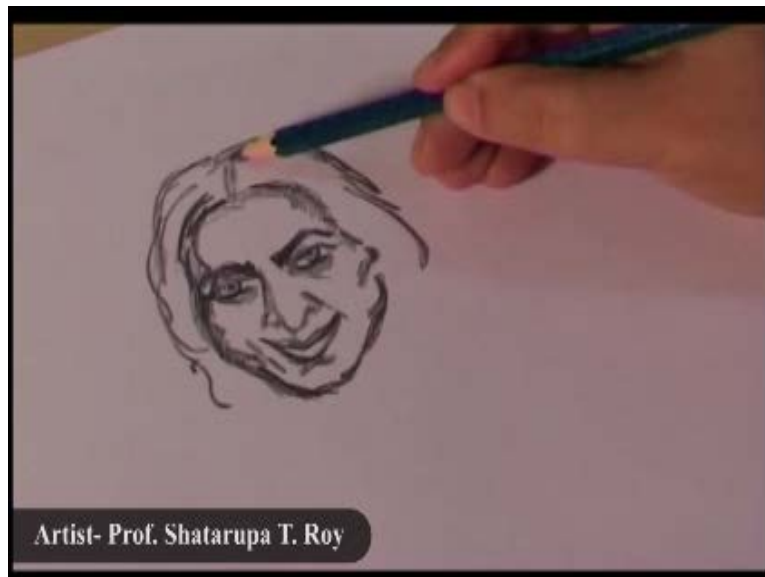
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Look at another face; this was one of the most sensitive photographs that was published during the Gujarat Riot, okay. Each muscle on the face, okay. Is pulled to the maximum the expression, okay? Now for understanding purposes it is fine you are looking at not the muscle movement but what appears on the face, okay. Is something that is known much more remarkable that the world looks at.

You must have seen artist's, okay. When they sketch, one of my colleagues she agreed to know for this show where now she is sketching various human expressions, look at them and see that the stroke of the pencil is basically used to demarcate it, change on the expression which actually represents the change in the muscle that right now we were talking about.

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Now you have a artists who is actually sketching human face and you can see here how the pencil moves.

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Artist- Prof. Shatarupa T. Roy

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Now each stroke here of a pencil actually defines that find certain specific expression is being put on the face. You can see here right now it has to do with the eyes, the eyebrows and gradually it goes to the lips. Can you sense the expression on the face, the emotion on the face. And now you have special strokes these are the strokes that actually helps you understand exactly what emotion has been put on the face.

Now understanding of emotion when you look at certain artifacts of course you have sculptures you have figurative artists who have sand sculptures, you have stone sculptures, free hand sketching like this where actually the artist will always try to minimize or maximize something on the face and that something is actually it has to do with the emotion. Now if you ask this artists.

That fine, do you know what facial muscles are actually involved in the expression of this type of an emotion. I am sure that the artist would not be able to do so. Even though the artist does not know which facial muscle actually has to do with increase in the intensity or the decrease in the intensity of a particular expression he or she definitely makes usage of it, and this is interesting

dynamics when you try to understand the allied areas of knowledge and how emotional influences these areas.

Besides now representing human sketch, if you look at the dance performance in the beginning we saw know, the expression of a dancer, look at this live program and see the expression on the face.

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Now I will show you a very different type of a situation, this is not an artistic presentation, this is the clip that has been taken out from a news item, when people in of a given drive, there were suppose to get displaced , dislodged because of the construction of the dam, and see the expression on the face.



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We started this lecture with a video know, when the artist was and know changing expressions on the face, we are ending this lecture with again a video, and this is from a documentary. The reason I am showing this to you, because you can see that when you mode the death of beloved one in the family, the way you cry is also culturally driven. But we have actually done is, we have seen how people express, how muscles are responsible, how now the cultural issues the3 nomus they influence, and you can see a mix, see this very video and see the impact of culture. Death of somebody bring more, a women cries and the pattern of cry is culturally driven.

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Actually what you find is movement of very women when the family members are actually crying they are showing their emotion after the death of a family member.

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See how culture influences the crying behavior the display of sadness in these two videos.

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