

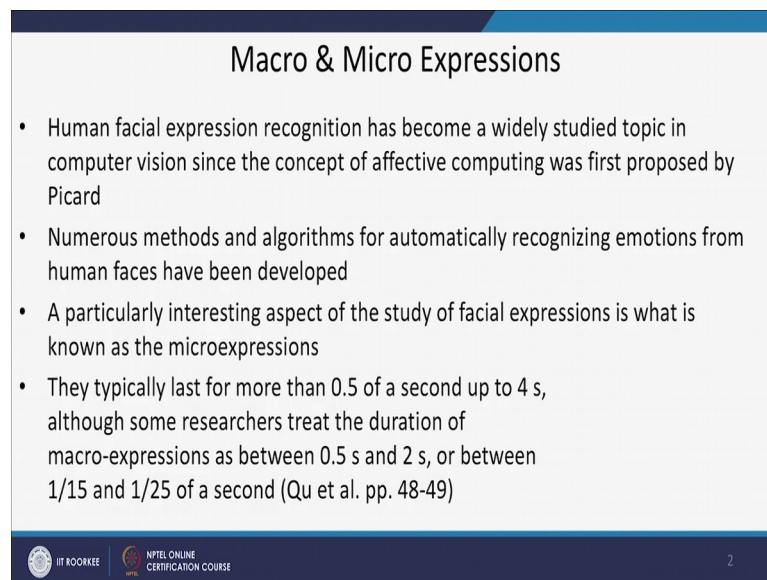
Body Language: Key to Professional Success
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Lecture - 10
Macro and Micro Facial Expressions

Dear participants, welcome to the 5th module of the second week. In the previous module, we had seen the significance of facial expressions and how they are being linked with the latest technological developments. Human facial expressions as well as their recognition by computers has become a widely studied topic since the concept of affective computing was first introduced by Picard. Numerous methods and algorithms for automatically recognizing emotions from human faces have been developed and they are still being developed in diversified ways.

A particular interesting aspect of the recognition of facial expressions is based on our understanding of what is known as micro expressions. Micro expressions are those facial expressions that come on our face in a very fleeting manner.

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Macro & Micro Expressions

- Human facial expression recognition has become a widely studied topic in computer vision since the concept of affective computing was first proposed by Picard
- Numerous methods and algorithms for automatically recognizing emotions from human faces have been developed
- A particularly interesting aspect of the study of facial expressions is what is known as the microexpressions
- They typically last for more than 0.5 of a second up to 4 s, although some researchers treat the duration of macro-expressions as between 0.5 s and 2 s, or between 1/15 and 1/25 of a second (Qu et al. pp. 48-49)

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They last not more than half a second up to 4 seconds and some researchers say that the duration of micro expressions is even less. For example, some say that it is between half a second to 2 seconds whereas, some critics think that it is even shorter than this. Macro expressions as we have a studied in our previous module or what is known as the regular


expressions or the normal expressions which come on our face. These expressions match the content of what we are saying and they also match the voice modulations. They can normally be seen and evaluated by people and therefore, they form the basis of communication. They can be in general understood by viewers and they also have what is known as a repeatable capability.



Micro expression on the other hand display an emotion which is rather concealed or an emotion which the speaker does not want to exhibit openly and therefore, they showcase repression or oppression of feelings. At the same time we have to understand that it is rather tough for us to conceal the micro expressions.

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Macro and Micro Expressions

- **Macro expressions:** normal/regular expressions: match the content and voice modulations. Can be normally/routinely seen and understood by viewers. May also be repeated often
- **Micro expressions :** display a concealed emotion, showcase repression or oppression of feelings, an emotion which we do not want to display. Are very brief
- It is very difficult to conceal microexpressions
- Voluntary and an involuntary emotional responses occurring simultaneously and conflicting with one another
- Also because they occur in a fraction of a second



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Micro expressions occur normally when there are two conflicting emotions going on in our heart simultaneously. One may be voluntary and the other may be involuntary emotional response. These responses are contradictory. For example, we may feel angry inside, but on the face we want to show our pleasure and appreciation. So, you would find that one emotion is oppressing; the other these two emotions are contradictory and the conscious or the macro expression would try to imitate the expressions of our appreciation and happiness.

On the other hand the micro expressions very briefly can suggest the truth of our emotional state because they occur in a fleeting fashion and therefore, their understanding as well as their concealment by the onlooker as well as by the speaker is

rather tough. Even though it is difficult to understand micro expressions as well as to conceal them.

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The slide features a portrait of a smiling woman on the left. To the right of the portrait, the text reads: "Microexpressions are... Signs of concealed emotions. Typically last less than 1/2 a second." Further to the right, it states: "Micro expressions are a Key to understand the complex emotional world we live in". The Humintell logo is positioned below the text. At the bottom left of the slide, the source is cited as "Source: <https://www.humintell.com/microexpressions-2/>". The footer contains the logos for IIT ROORKEE and NPTEL ONLINE CERTIFICATION COURSE, along with the number 4.

We find that if we are able to read them correctly, it becomes a key to understand the interaction in a proper way. We can say that our capability to understand micro expressions help us to understand the complex emotional world we live in and here is an interesting discussion of this idea.

What to better understand how people around you feel? Micro expressions are key to understanding the complex emotional world we live in. Recent research shows that emotional intelligence has an impact on how successful people are in their careers, being able to read emotional signals is one important part of that emotional intelligence. It allows you to better communicate with others established meaningful relationships and build rapport. So, what are the micro expressions?


They are signs of the concealed emotions that leak out when people are in high stakes situations, but are trying to control their feelings. They typically last less than half a second. Scientists have documented seven universal facial expressions of emotion that are expressed similarly by all people regardless of race, culture, age or gender. Research has also shown that people can be trained to identify these expressions relatively.

The term micro expression as well as the idea behind them was popularized by an American crime drama television series with the title of "Lie to Me".


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- Popularized by "Lie to Me" (stylized as Lie to me*), an American crime drama television series, originally ran on the Fox network in January, 2009
- In the show, Dr. Cal Lightman (Tim Roth) and his colleagues in The Lightman Group accept assignments from third parties (normally local and federal law enforcement), and assist in investigations reaching the truth through applied psychology: interpreting micro expressions, through Facial Action Coding System, and body language
- Lightman's character is based on that of Paul Ekman

Source: https://en.wikipedia.org/wiki/Lie_to_Me



(Image: <https://www.tvguide.com/tvshows/lie-to-me/295877/>)

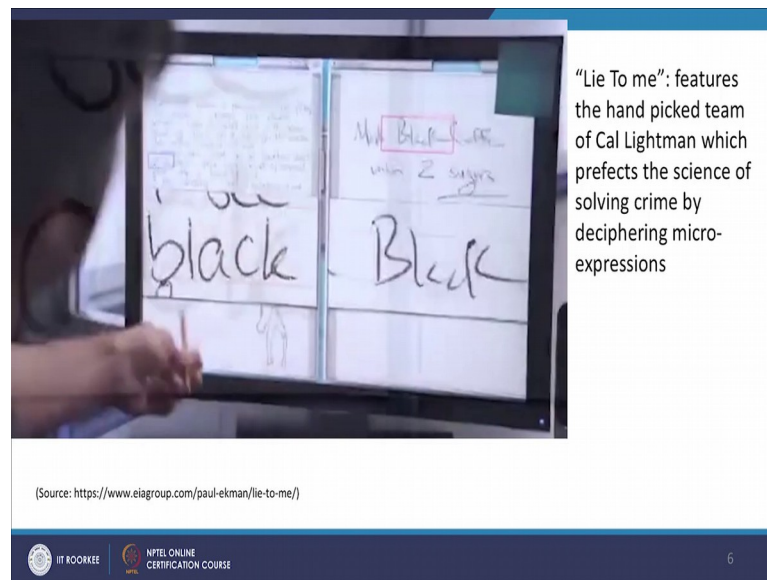


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It originally ran on the Fox network in January 2009. In this show we find that the protagonist Doctor Cal Lightman who has been modeled on Paul Ekman, the famous psychologist and his colleagues in what is known as the Lightman group take up assignments from different parties and most of these parties are the local in the federal law enforcement agencies and they assist in investigations and normally they are able to reach at successful conclusions and find out the reasons behind different crimes.

Their methodology is to interpret micro expressions through facial action, coding system as well as other aspects of body language.

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Lie to Me interestingly had featured a handpicked team of an imaginary effective character Cal Lightman and in this show we find that this team has perfected the science of solving crime by deciphering micro expressions. Various episodes of this TV show had popularized the idea of micro expressions in the public.

The twitch blink a tic.

Hence lower lids raised uppers.

Most people do not even notice them. With the Doctor Cal Lightman they tell him everything he needs to know. Are you trying to cover up a crime?

No.

Really?

He is the world's foremost authority in deception detection.

The President specifically asked for you do know I can tell when you lie on the job.

And with his handpicked team of experts they perfected the science of solving crimes.

You are holding your breath. You are hiding something.


Two blocks.

I will know if you are lying, but why mister you see.

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Macro and Micro Expressions

- 1966: E.A.Haggard and K.S.Isaacs, "Micro-Momentary Facial Expressions as Indicators of Ego Mechanisms in Psychotherapy"
 - While looking at films of couples who were in therapy, they noted behaviors that would flash by so quickly they were difficult to grasp by naked eye. They noticed them while by slowing down the film. These expressions occur before we are conscious of them
- Paul Ekman later also came to similar findings and observed same behaviors. He coined the term "micro expressions" while he was studying deception
 - Ekman later incorporated this into his book, "Telling Lies: Clues to Deceit in the Marketplace, Politics and Marriage"(1985, 2009)



Delight, guilt, pride, contentment, shame, and relief are a few examples of **MICROEXPRESSIONS.**

(Image: <https://socialmettle.com/how-to-detect-microexpressions>)



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Even though the studies of expressions of emotions on human face had been a part of the study programs of various ethnologist and behavioral scientists who had taken of their studies of non-verbal aspects of communication, we find that the idea of micro expressions came into existence with the research work of two scholars EA Haggart and KS Isaacs who published a paper in 1966 with the title Micro Momentary Facial Expressions as Indicators of Ego Mechanisms in psychotherapy. They were looking at the behavior of couples who were undergoing psychological therapy and they were watching different films and they noted that there are certain behaviors which would flash so quickly that it was difficult to grasp them by naked eye. They stumbled upon these aspects of human behavior only when they were watching the films by slowing them down. They noted that certain expressions occur and go even before we become conscious of them and they gave them the name micro momentary facial expressions.

Later on we find that Paul Ekman in his independent research also came to similar findings and observed similar behaviors while he was studying deception. He also became conscious of these micro expressions and he coined the term. This term was incorporated in his book *Telling Lies: Clues to Deceit in the Marketplace, Politics and Marriage* which was initially published in 1985. But the revised version came up in 2009

and it was in the 2009 edition that he has incorporated his findings about what he has termed as micro expressions.

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Telling Lies

- Paul Ekman's *Telling Lies: Clues to Deceit in the Marketplace, Politics, and Marriage* (1985, 2009), is a breaking work that gives insights into lying, emotional leakages and clues to deceit. It traces the deception strategies of international public figures, such as Hitler and Richard Nixon, also the deceitful behavior of private individuals, including adulterers and petty criminals
- His study describes how lies vary in form and can differ from other types of misinformation. Also, how a person's body language, voice, facial expressions can give away a lie but still escape the detection of professionals
 - Judges, police officers, enforcement agents, including lie-detectors

Paul Ekman

TELLING LIES

[Image: <https://www.interest.com/in/317855886120545452/>]
[Source: "Telling Lies", Google Books, Google books.google.ca/books/about/Telling_Lies.html?id=71_vt0Dfwwg&redir_esc=y]

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Paul Ekman's work is a path breaking work and it gives us insights into line emotional leakages of our emotions and also to the clues to deceitful behavior. In this book Ekman has traced the deception is strategies of various international public figures for example Adolf Hitler and Richard Nixon and he has also looked at the deceitful behavior of various private individuals including certain petty criminals as well as adulterers to understand the difference in macro and micro expressions.


His study describes how lies vary in form and can differ from other types of misinformation. He has also looked closely as how an individual's body language, voice, facial expressions in particular can give away a lie and people who are sensitive to the micro expressions can understand these lies.

However, a person can still escape the detection by professionals, a person can escape detection for example by police officers, by judges, by various other law enforcement agents and can also escape the mechanical lie detectors, micro expressions occur in everyone. However, as we have discussed earlier it is perhaps impossible to conceal them and they occur in an unconscious manner.

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Macro Expressions	Micro Expressions
Obvious or "normal" facial expressions	Often misinterpreted or missed altogether
Last between 1/2 a second to 4 seconds	Occur in 1/2 a second or less
Match the content and tone of what is said	Unconsciously display a concealed emotion

- Micro expressions occur in everyone, often without their knowledge
- There is no way to prevent them from occurring
- Learning to detect this leakage is critical for emotional intelligence and deception detection



Source: <https://www.paulekman.com/resources/micr>

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We cannot prevent them from taking place and learning to detect this leakage is critical to emotional intelligence as well as for understanding deception in the behavior of other people this list gives us the difference between macro and micro expressions. Macro expressions are what we understand to be obvious or normal facial expressions. In comparison to that micro expressions are either often misinterpreted or missed altogether. Not everybody can make out the difference between a macro and micro expression and can lose the significance or the meaning of micro expressions.

Macro expressions last for certain seconds, so that most of us can easily make out the expression on the human face. In comparison to that micro expressions occur in a fraction of a second and therefore, the detection is difficult. Macro expressions match the content they express the same idea through our facial expressions which we are trying to express with the help of our words and they also match the tone of the voice. However, micro expressions unconsciously display a concealed emotion.

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Benefits of understanding Micro Expressions

- Micro expressions are like leakages of emotions: reflect the mildest vacillation in a person's emotional state, offering us a window into the emotional states of others
- Leakage may be limited to one region of the face in a subtle manner or in the form of a quick expression flashed across the whole.
- Increase Emotional Awareness
- These help us in becoming aware of lies and deception as unlike verbal codes, we have some understanding of these expressions
- Ekman's training programs: developed a one-hour self-instructional program that trains people to observe and understand "micro expressions"
- An expression is like a word: context



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Understanding micro expressions is beneficial in our day to day life. If understanding body language helps us to understand the true intent of the other person; micro expressions and their understanding further hones these skills.


Micro expressions are like leakages of emotions. They reflect the vaccinations of the mind in a persons emotional state and therefore, they offer as a window to their internal emotional turbulence of another person. These leakages may be reflected in one region of the face in a highly subtle manner or in the form of a very quick expression which has been flashed across the whole face, but they increase our emotional awareness and they help us in becoming aware of lies and deceptions as unlike verbal quotes we find that micro expressions have certain universalities.

It is interesting to note that Paul Ekman had also started his training programmes. He had developed an one hour self instructional program that trains people to observe and understand micro expressions; whereas it is helpful and beneficial to be able to understand micro expressions.

We also have to remember that a single expression on our face whether it is micro or macro is like a word in a particular context. A word can have different meanings and in order to place the meaning of a word properly we also have to understand the context completely and therefore, we should not over read as far as micro expressions or other macro facial expressions are concerned.

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- Microexpressions are typically classified based on how an expression is modified. They exist in three groups:
- **Simulated expressions:** This is the most commonly studied form of microexpression. It is not accompanied by a genuine emotion. Occurs only as a brief flash of an expression, face returning to its normal state immediately after it
- **Neutralized expressions:** when a genuine expression is suppressed and the face remains neutral. This type of micro-expression is not easily observable. Some people can suppress it effectively
- **Masked expressions:** when a genuine expression is completely masked by a falsified expression. Masked expressions are microexpressions that are intended to be hidden, either subconsciously or consciously
- Only 3% people are able to successfully comprehend these



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Micro expressions are further classified in various ways. Largely we can say that they exist in three groups; simulated, neutralized and masked expressions. Simulated expressions are most commonly studied forms of micro expressions. It is not accompanied by a genuine emotion, it is like an effect display.

It occurs only as a brief flash of an expression and immediately afterwards the face returns to its normal state. A neutralized expression occurs when a genuine expression is suppressed and the face remains, otherwise neutral. This type of micro expression is not easily observable. Some people can miss it altogether. A masked expression is when a genuine expression is completely masked by a falsified expression.

Masked expressions are also micro expressions that are intended to be hidden either subconsciously or consciously. Very few people have the capability to successfully comprehend micro expressions on a face. Researchers tell us that only about 3% of the population can have this capability.

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- **Controlled microexpressions**
 - facial expressions are not always uncontrolled. Some people are born able to control their expressions (such as pathological liars), while others are trained, for example actors. "Natural liars" may be aware of their ability to control microexpressions and the ability to get away with their lies as children
- **Voluntary and involuntary, truthful and false/misleading**
 - People can simulate emotion expressions, attempting to create the impression that they feel an emotion when they are not experiencing it at all
 - A person may show an expression that looks like fear when in fact they feel nothing, or perhaps some other emotion
- **Ekman (2001) also talks about Squelched Expressions**
 - Expressions that are immediately curtailed by instantly changing one's expressions
 - It is important to note that micro-expressions are complete with respect to temporal parameters, but squelched expressions are not, although they last longer' (Bhushan p. 268)



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Micro expressions can also be controlled voluntary and involuntary. Facial expressions can also be sometimes controlled. Some people are born with the capability to control their expressions. For example, there are some pathological liars who are able to get away with small lies when they are children and then they develop this skill whereas, some other people are trained to control their micro expressions. However, on an average in professions like us we find that the control of micro expressions is very difficult.

Sometimes we find that people can simulate emotion, expressions and they may attempt to create the impression that they feel an emotion whereas, they are not experiencing it at all. A person may show an expression that looks like fear when in fact they may feel nothing or maybe they feel a different emotion altogether. Another term which Ekman has used is squelched expressions. It means that when expressions are immediately curtailed by instantly changing one's expressions.

It is important to note that micro expressions are complete with respect to temporal parameters, but research shows that squelched expressions are not although last longer.

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- Facial expressions of emotion are controlled for various reasons
- Socio-cultural conventions, shared by most people
 - Many societies, for example, encourage the idea that boys/little men do not cry or look afraid; or girls should not talk loudly or show aggression
- There are also more personal display rules, product of the idiosyncrasies or preferences of a particular family
 - A child may be taught never to look angrily at his father, or never to show sadness when disappointed
- These display rules, whether cultural or personal, are usually learned at a very early age:
 - Gender conditioning is imbibed by the time a child is three years old
- So, the control of the facial expression they dictate is done automatically ,without thinking or awareness



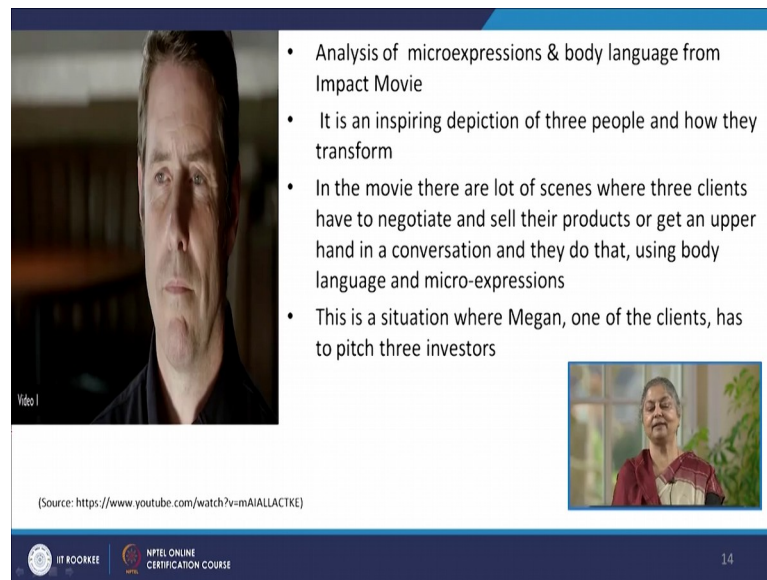
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There are different reasons because of which we learn to control our facial expression of emotion. There may be for example socio-cultural conventions or individual rules running within families or a smaller segments of society. Many societies for example encourage certain behavior in young boys and in young girls. Some societies encourage the idea that young boys or little manners they are called do not cry or look afraid. Similarly girls are encouraged not to talk loudly or to show aggression.

At the same time there may be other display rules which are considered to be more personal. There may be the product of preferences or even idiosyncrasies of particular individual families or a small social gatherings. For example, in a family a child may be taught never to look angrily at his father or never to show sadness when disappointed. These display rules whether they are cultural or personal are usually learnt at a very young age.

For example, researchers tell us that gender conditioning is imbibed by a child before he or she has completed 3 years of age. So, the control of the facial expression, these conventions and family atmospheres dictate is done automatically is imbibed in a subconscious manner without being aware of them and therefore, these learnt behaviors allow us to control the expression of our emotions on our face. Here we are displaying a very interesting video from impact movie.

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- Analysis of microexpressions & body language from Impact Movie
- It is an inspiring depiction of three people and how they transform
- In the movie there are lot of scenes where three clients have to negotiate and sell their products or get an upper hand in a conversation and they do that, using body language and micro-expressions
- This is a situation where Megan, one of the clients, has to pitch three investors

(Source: <https://www.youtube.com/watch?v=mAIALACTKE>)

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It is an analysis of micro expressions and body language. It is an inspiring depiction of three people and how they are able to transform themselves and overcome their situations. There are lot of scenes where three clients have to negotiate and sell their products or they try to get an upper hand in a conversation and they are able to do it using their micro expressions and using different strategies of body language. In this particular clip we find that one of the clients Megan has to pitch three investors.

What you see here on the investors face is just the two lips going upwards. It is a simple smile and because the two lip corners go upwards symmetrically, it means that it is a genuine happiness. If you have look in slow motion with a close up, this is how it looks, all right. See the two lip corners going upwards first slightly and then even more you know that is a genuine smile.

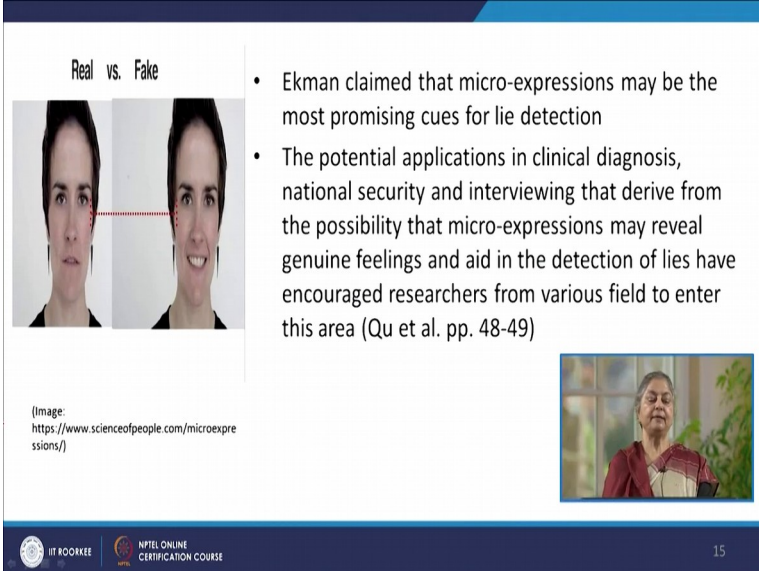
That was an easy one to warm up just an expression of happiness, all right. Once see it once more. What you can see here happening here that is pressed lips and he is staring and the source of his anger that is why this press lips is a meaning of anger and then what happens is shaking his head, but that is not the micro expression. There is something more.

Do you see this little twitch on the right side of his face here before he shakes. No, that is an expression of content superiority. He does not like what he hears, he does not like what he sees. So, here the right solution is a combination of anger and content. Let us

have a look in even slower slow motion from closer. This is the pressed lips and the content on the site. So, this little twitched here, this little movement on the right side, I am moving back and forth that is content. That is how you can see it. You see it right here at this moment very very tiny and that is how you can see that there is anger and content.

In his research Paul Ekman has claimed that micro expressions are perhaps the most promising cues for detecting a lie.

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Real vs. Fake

- Ekman claimed that micro-expressions may be the most promising cues for lie detection
- The potential applications in clinical diagnosis, national security and interviewing that derive from the possibility that micro-expressions may reveal genuine feelings and aid in the detection of lies have encouraged researchers from various field to enter this area (Qu et al. pp. 48-49)

(Image: <https://www.scienceofpeople.com/microexpressions/>)

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The particular picture which has been displayed here in which one display of emotion is real whereas, in the second picture the same display is of effect; emotion finds out the difference between a true expression and the detection of a lie. Through a micro expression, Ekmans idea has potential applications in various fields. For example, there are significant in clinical diagnosis.

They are also significant for understanding contemporary threats to national security as well as in similar other situation. The potential of this research has encouraged people from various fields to enter this area and to study it in diverse fields.

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Analysis of an American Actor Kato Kaelin's Microexpressions of Disgust & Scorn by Dr Paul Ekman, a renowned expert in emotions research and nonverbal communication

(Source https://www.youtube.com/watch?v=_oJ2L6Cvss)

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In this module, I have repeatedly referred to the work of Paul Ekman who is a renowned expert in emotions research, a non-verbal communication. I conclude this module by displaying this particular snippet in which Paul Ekman is analyzing an American actor Kato Kaelin's micro expressions and he is analyzing how the expressions of disgust and his con are displayed by this actor.

So, you are going to see Kato Kaelin is houseguest of Urge a sentence who is being questioned by Margaret Clark, a district attorney in an unfriendly fashion.

At the end of the year of 1993 he was dating Paula Barbieri. Wasn't he?

And he is trying very hard. You can see how I was really feeling which was he is very angry and when he shows is a very fast micro expression of disgust, anger, scorn. He does something like that, but he does it much more quickly than I am doing because it is a micro expression.

Mister Kaelin, you have got a lot of money for your appearance on current affair. Didn't you?

Yes.

What you are saying is gone is a combination of anger in disgust we including ours raising antonius.

So, today we have discussed the difference between micro and macro facial expressions and what exactly is the significance of understanding micro expressions in our interpersonal behavior. In the next module, we would look at the expressions of his smiles as well as the connotative interpretations of our head notes etcetera.

Thank you.