Emotions

Module Details

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Content Outline:

1. Objectives:

At the end of the session learners will be able to:

- Explain Nature of emotion
- Describe physiology of Emotion
- List theories of emotion
- Identify Disorders of Emotion

2. Introduction

'How are you?' The start of any conversation between two individuals mostly refers to the state of our physical health or our feelings on any single day.

I feel happy,I feel sad or angry.Weare constantly labeling our feelings.These feelings are what psychologists call emotions.

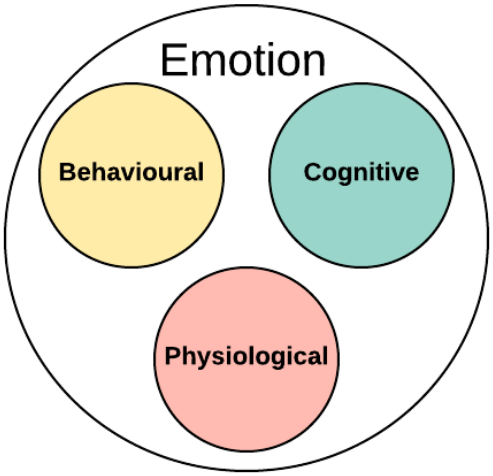
No other construct has been described more frequently by songs or poems. We are constantly trying to understand our feelings and the feelings of others. It helps us maintain relationships and have successful interactions.We are often trying to be in control of our emotions as well. We want to achieve the ultimate goal of happiness.

So what are emotions? Our emotions are a response to a stimulus or situation that we come across. They have three components: Physical, cognitive and behavioural

For example:

We come across a tiger while walking in a jungle. The moment we encounter the tiger we go through various processes,our body may react by having a raised heartbeat ,sweating ,our mouth may go dry or we may scream (physical reaction) We also think that this creature is a threat and that we need to run as fast as we can to safety (cognitive response) We would also probably react by actually running away as fast as we can from that location.(behavioural response)

Three main aspects of Emotion : Cognitive, Behavioural and Physiological

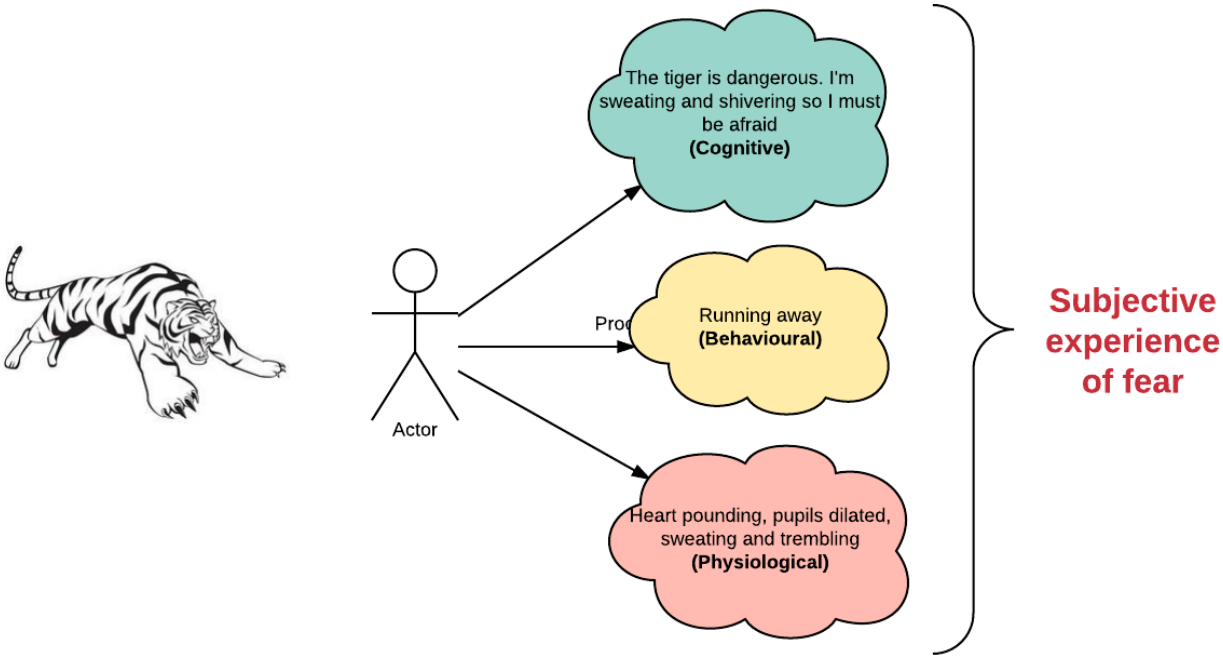


How do we go through this process each time? Most times we are probably aware of the bodily reactions to a stimulus and unaware of the thoughts that accompany it.

Divya was shouted at by her teacher which made her cry. She may be unaware of the thoughts going through her head which would be ;

1.How humiliating it is to be shouted at in front of the class or how dare she shout at me like this. Her response which was to cry is what she is probably aware of at the time. This would be the cognition or thoughts which made her

cry. She also probably felt her heart racing and mouth go dry which are physiological reactions in response to the situation.



Think of the last time that you were very angry or very sad. Try to analyse the various processes that took place for you to experience that sadness or anger.
You will find that there was a thought and physical reaction that occurred along with a behaviour in response to the situation. The physical reaction would have been obvious but the thoughts often are not.We are thinking them but are often unaware of these thoughts that influence our emotional reaction.
Since the reaction to a stimulus or situation has different components how do we understand these feelings in terms of brain functions.To have any physical and cognitive response we cannot ignore the involvement of the brain. We will try to understand the different brain areas responsible for emotional experience.
Let us understand the general nature and characteristics of emotions.

3.Nature of emotion:

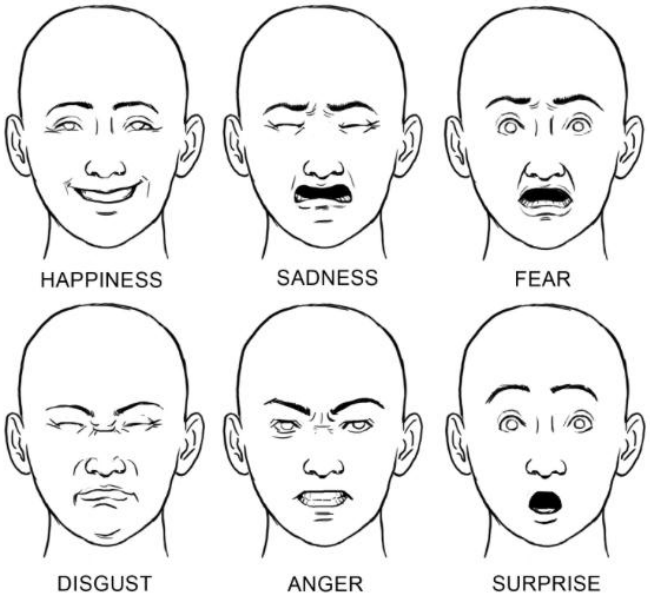
Emotions have been defined by various psychologists.
Robert Plutchik (1980) and KT Strongman (1987) quoted more than 30 definitions of emotions.
Common elements of all these definitions include a situation leading to a feeling which involve our physiological reactions and thoughts and maybe behaviour
Shaver ,Shwartz,Kirson and O'Connor (1995) demonstrated that the six common emotions are love, joy ,surprise ,anger ,sadness and fear. All the

emotions we experience are combinations of these basic emotions , positive and negative .

Paul Ekman (1972) who has conducted many studies in the area of emotion has identified universal emotions. They are happiness, sadness,fear, disgust ,surprise and anger. This means that these basic emotions are experienced by all humans in different cultures and the facial expressions attached to these emotions are also the same across cultures.

Following are pictures of universal emotions:

https://www.craftsy.com/blog/2013/06/drawing-expressive-faces/



What are the characteristics ofEmotions ?

- They are universal which means that the facial expression attached to these basic emotions are consistent or the same across cultures. A sad man in Japan has a similar facial expression to a sad man in India.Paul Eckman identified universal emotions Happiness,sadness,fear,disgust ,surprise and anger. However, cultural differences exist in specific emotional expressions and their attached meaning.Like winking or raising an eyebrow. It has also been found that western cultures demonstrate emotions slightly differently from many eastern cultures.Gender differences also play an important role in expressionof emotion.Men in general are expected by society to display lower intensity of emotional expressions as compared to women. That difference is influenced by gender stereotypes and upbringing. Nowadays one may not stop a little boy from crying by saying boys shouldn't cry.

- They are positive or negative

- They are different in intensity and length. Emotions are temporary while a mood is more long-lasting.You may be very angry in response to seeing a person kicking a stray dog versus slightly angry if someone knocks over a flower pot while riding a cycle.

- They are involuntary which means that one cannot control the experience of emotion completely…you may be able to reduce the intensity of your emotions experienced. You may be able to control your expression of anger or reduce your disgust or surprise depending on the situation, but the basic experience of emotion is involuntary

- They are innate. New born babies smile in similar ways to grown ups ..no one has taught them to smile or laugh. Studies with visually impaired people also find that expressions of basic emotions are the same even though they have never seen anyone display those emotions.

Why do we need Emotions?

According to Darwin they have adaptation value which are required to survive and reproduce. They are required to flee from a threat, to love and reproduce and to survive.

They also motivate us to take action; for egwhen we are afraid of a snake in front of us it makes us run away rather than walking towards it and risk being bitten.

It also helps us take decisions which are adaptive. We choose one person to marry as they make us feel happy.This would in turn lead us to having a relatively good life versus being with someone who makes us angry or sad.

4. Physiology of Emotion

What happens to the brain when we are experiencing any feeling? Are different parts of the brain involved in the three processes involved in emotion.?

Sonal has just had a fight with her best friendMinal. Her friend called her names and this has made her cry.She is also very angry. At the same time she feelsher heart beating fast,she wants to scream out and tears are running down her cheeks.

She labels her emotion as anger mixed with sadness. Her body is also reacting at the same time. What are the various processes involved in her bodily reaction and understanding of her feelings?

Her Autonomic Nervous System(ANS) is involved in experiencing these emotions. The two parts of the ANS are the Sympathetic and Parasympathetic Nervous System. The Sympathetic Nervous System is responsible for the Fight or Flight response. This is essentially the preparedness response to deal with

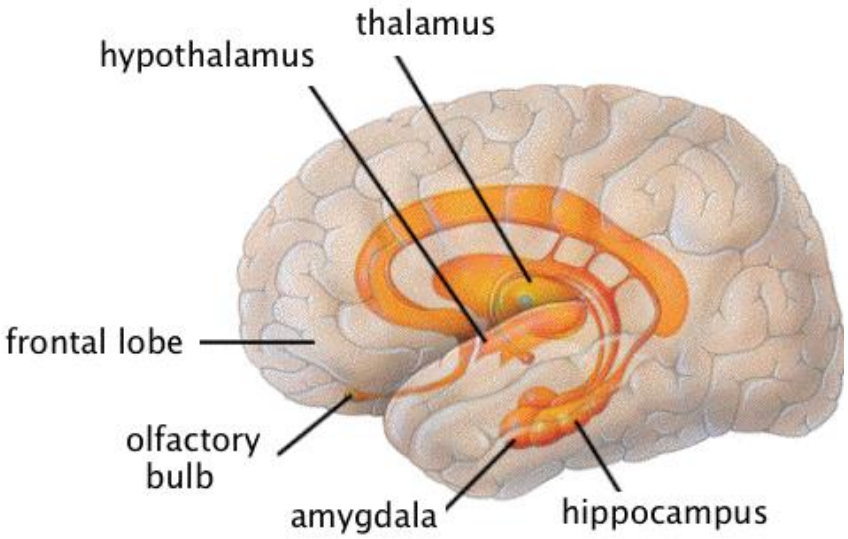
any stressor in front of us. Once the stressor has passed, the Parasympathetic System brings it all down to and Rest and Digest.

The ANS is involved in the bodily responses to emotions like increased heart rate, perspiration, pupils dilating, dry mouth, and glucose release by the liver for more energy and lowering digestion . It also involves the adrenal glands which are located above the kidneys. The adrenal gland is responsible for secreting the hormone adrenaline.

If we go back to the example of encountering a tiger.The moment we spot the tiger the ANS kicks into action with the release of Epinephrine. This leads to an increase in heart rate ,reduces saliva formation and digestion and increases glucose release for higher energy. Our pupils dilate and we gather our strength to run away.

Once the threat has passed our body comes back into resting state to build reserves and resources. Our heart rate comes back to normal and blood supply for digestion is restored.

The primary areas involved in emotional experience comprise the limbic system and cerebral cortex. The limbic system consists of different parts mainly the Thalamus,Hypothalalmus, Amygdala and Hippocampus.The limbic system is situated just above the brain stem.



If we had to define each of these parts in terms of their function this is how they work.

Thalamus – The Thalamus is the Relay station. Messages go through and from the thalamus between the brain and body. So whatever we experience through our senses that is what we see ,hear and touch are relayed to the thalamus and then is transmitted to the cortex for interpretation. The sense of smell bypasses the thalamus

Hypothalamus- It is a small structure below the Thalalmus. It regulates the ANS response of fight or flight and rest or digest. It also regulates the hormonal responses of Epinephrine or Norepinephrine commonly known as adrenaline .

Hippocampus- This is where Short Term Memory moves into Long Term Memory. The Hippocampus is integral to the formation of Long Term Memory. Memories evoke emotion. If you think of a time when your friends and family had thrown you surprise party then that memory would evoke a positive feeling.If you had been bitten by a dog in the past then the presence of a dog in front of you would probably evoke fear. You would remember that episode and consequently interpret the presence of a dog as a threatening event. If the hippocampus is destroyed one may retain old memories but new ones are not formed. You may avoid certain situations or people since they evoke negative feelings in you.

Amygdala - It is the seat of aggression,fear and anxiety .If we stimulate the amygdala it produces feelings of fear, rage, anxiety and aggression It was found that bilateral removal of the amygdala in animals led to a syndrome called the Kluver-Bucysyndrome.This resulted in hyperorality (excessive eating and mouthing of objects) hyper sexuality and disinhibition.

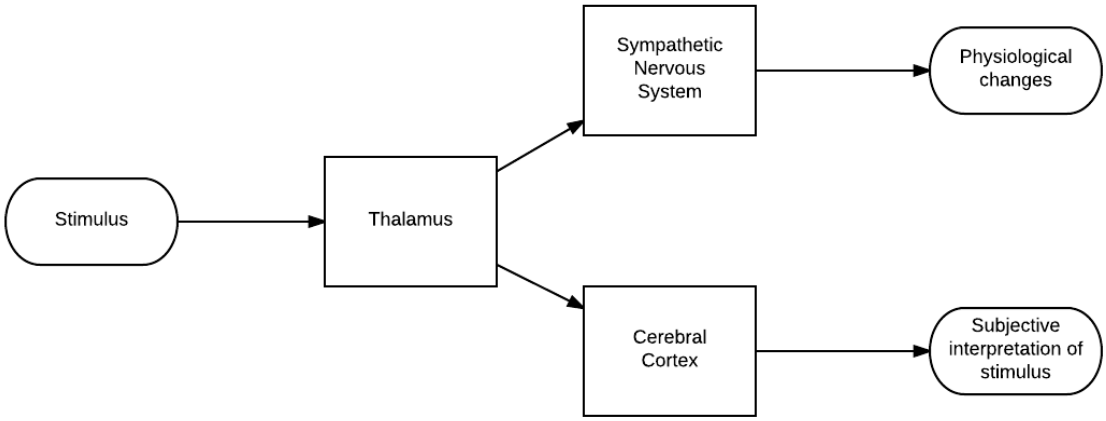
Cerebral Cortex-It is involved in the perception of emotion and subjective experience of emotion. The cortex is divided into the left and right hemisphere. Left hemisphere is involved in positive emotional experience and right hemisphere is involved in negative emotional experience.This is called the emotional valence theory.

The emotional valence theory has been supported by studies examining the effects of emotional experience on electrophysiological responses recorded using an EEG. Participants were made to watch videos evoking positive or negative emotions.For example, videos of puppies playing versus videos showing people with burns or leg amputations which would normally evoke fear and disgust. They had connected them to EEGs while this was happening and it was found that videos which had positive content and thus evoked positive feeling showed electrical activity in the left hemisphere. Videos evoking negative feelings corresponded with brain activity in the right hemisphere.

The whole circuit involving these various brain parts is important in our subjective experience of emotion.

So going back to the above example,when Sonal is experiencing her emotion of anger lets analyse how the brain is reacting to this event : Her friendMinal approaches her and she notices an angry expression on her face. Due to her memories stored in the hippocampus she is able to interpret the expression as an angry one and her thalamus relays this message to the cortex for further interpretation. Her ANS releases adrenaline which readies her body to react to the situation .

Once she has interacted with Minal her cortex tells her that Minal is being unfair and how dare she accuse her of something she hasn't done. Her body is ready to respond so she walks away.At the same time she also cries in response to the unjust treatment given to her by Minal.



5. Theories of Emotion

The theories of emotion are divided into the theories that emphasize the influence of physiological arousal versus the influence of cognitionon our emotions.

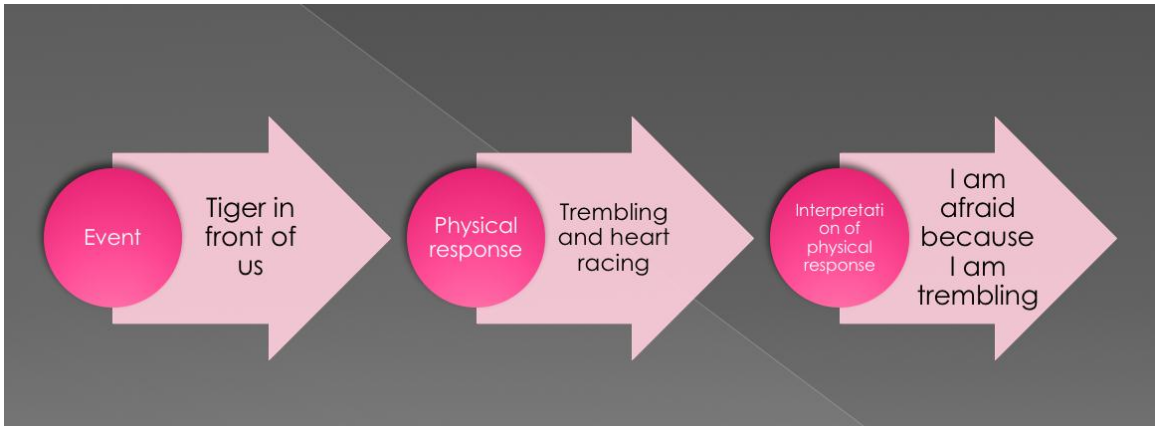
The older theories based on importance given to bodily response are

5.1 Phsyiological Arousal Theories

1. James-Lange Theory

William James (1890) and subsequently Charles Lange (1922) propounded a theory which was that we feel emotion in response to our interpretation of our bodily response to a stimulus

For eg : we are walking and we come upon a tiger …we start trembling ,shivering and heart racing and maybe even cry. Once we do this we realize and label that feeling or emotion as fear.So one could say I am afraid because I am shivering and crying



2. Cannon –Bard Theory

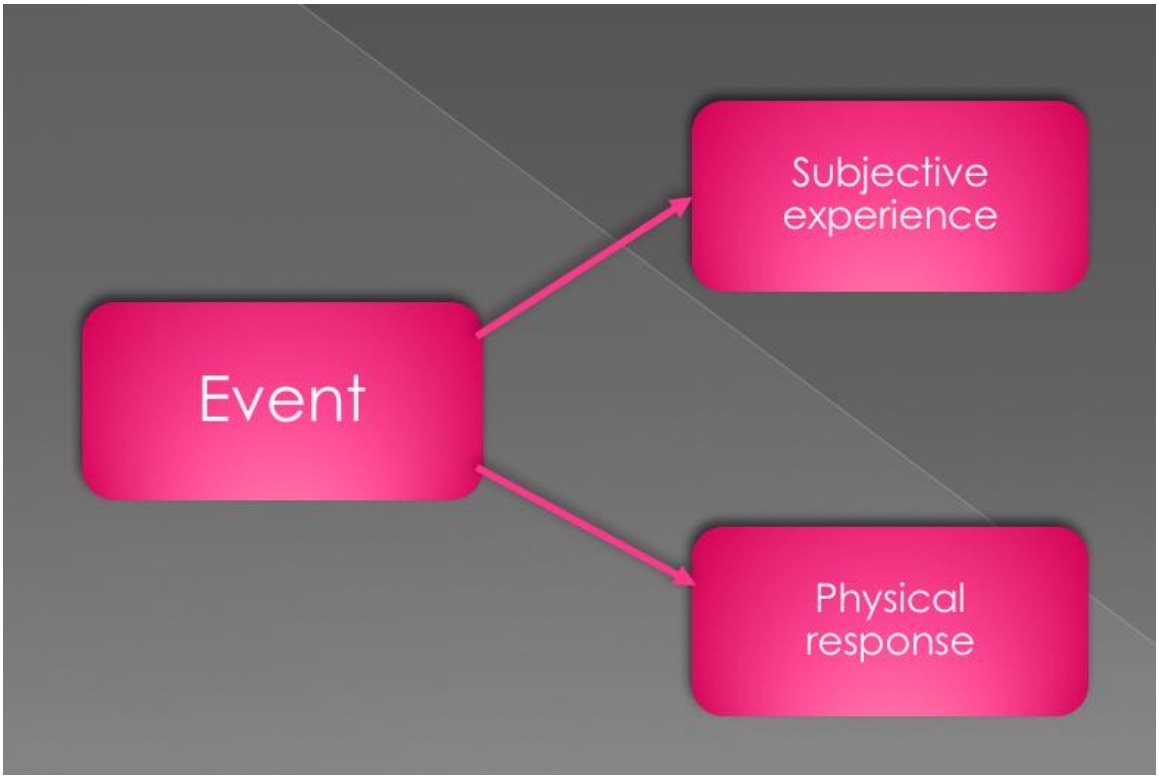
In 1927, Walter Cannon criticized this theory and made the following points to support it

- Physiological responses tomany emotions may be the same.For example I may shiver or have accelerated heart rate in the presence of a tiger or in the presence of a person I am attracted to.

- The response time of the ANS is often slower than the emotional experience especially in an emergency situation. So, if we hear a loud sound we would be afraid and surprised at first and then feel our heart racing and hands trembling.

Cannon proposed his own theorywhich was revised by Phillip Bard (1934) and was then called the Cannon-Bard theory.
They proposed that the ANS response and emotion occurred at the same time in response to an event.The information is relayed via the thalamus simultaneously to the cortex where it is labelled . At the same time it is also relayed to the hypothalalmus and ANS where a physiological response is generated.

If we used the above example one would explain that the tiger in front of us immediately evoked an ANS response and at the same time a feeling of fear.The immediate fear response was a function of the amygdala and the slower cortical response of labeling the emotion as fear was due to the cortex .
Thus, the emotional experience and physiological arousal are simultaneous and independent of each other.



5.2 Cognitive Theories:

1. Schacter-Singer theory orTwo Factor Theory

The third and alternative explanation was to assign the cognitive interpretation of the event as the key factor in experiencing emotion and the ANS response.

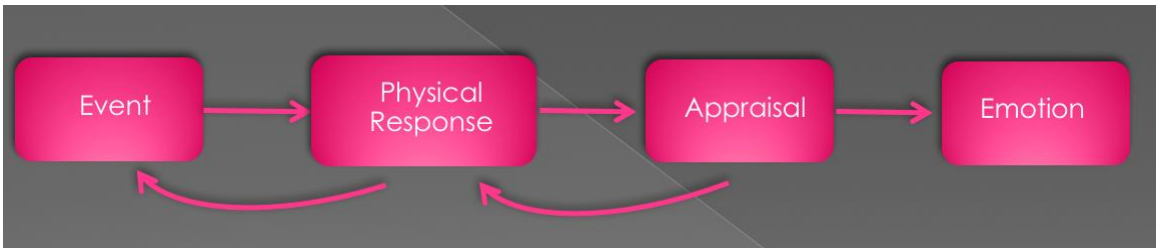
Theorists Stanley Schacter and Jerome Singer (1962) proposed the cognitive theory of emotion where an event is first analyzed and interpreted by the cerebral cortex. There it is labeled and experienced as fear or love depending on our appraisal of the stimulus as well our appraisal of the ANS response.

In the above example if we encounter a tiger we would cognitively interpret the situation as a threatening one and experience increased heart rate and sweating and shivering. We interpret both the situation and our physical response as one of fear after appraising both these things. Thus it was called the two factor theory.

Their basic premise is that physiological arousal experienced due to different emotions is often the same.It is our cognitive understanding of the arousal and the stimulus that determines the labeling and experience of the emotion.

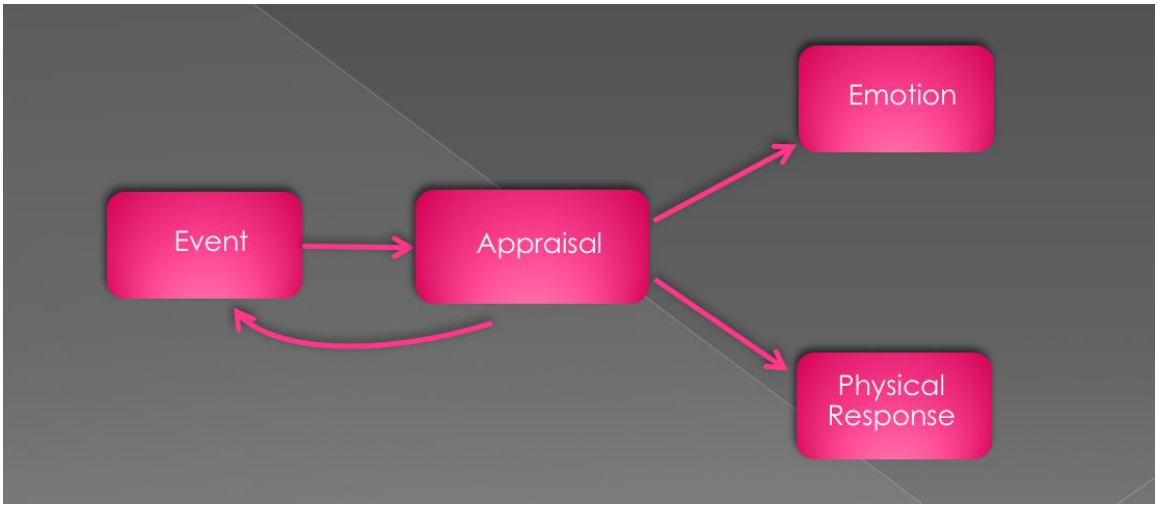
Imagine that Rajeev is sitting on a giant wheel for the first time.Once it starts moving fast he may experience his heart pounding,a funny feeling in his stomach and a general heightened ANS arousal. In case Rajeev is afraid of heights and is scared of falling down he would label his arousal as fear. If Rajeev loves to climb mountains and has absolutely no issue with heights he would label his arousal as excitement and a positive feeling.

Schacter and Singer conducted an experiment in 1962 with college students to further explore their theory.
Students were told that they were going to study of the effect of vitamins on vision. They were injected with Epinephrine which causes arousal of the ANS.
An actor who was a partof the experiment was brought in to act in a happy or angry manner. They had predicted that the arousal caused by the drug would be interpreted differently by both groups of students.
The group exposed to the happy actor rated themselves as happy and the other group rated themselves as angry. Those who were informed about the drug interestingly attributed their arousal only to the drug and the behaviour of the actor did not influence them at all.
Here we see that attribution of bodily arousal to three different situations caused the experience of the three different emotions in the subjects.



2. Lazarus theory or Cognitive Appraisal Theory.

Here the experience of emotion and arousal depends on the cognitive appraisal or evaluation of the stimulus.Based on one's personal history and experience and cultural background the stimulus is appraised and labeled positively or negatively and the physical response is also experienced.
For example if we had to encounter a stray dog while walking in our neighbourhood we could appraise that as a positive or negative event and feel happy or fearful depending on our past experience.
This differs from Schacter and Singer's two factor theory where the appraisal of the event and the physiological response are determinant to experiencing emotion .



6. Disorders of Emotion

So far we have understood that emotions are critical to human functioning and have adaptive value. What happens when we experience a dysregulation in emotional experience ? How do we recognize,understand and subsequently manage these disorders of emotion .

Emotional disorders are so named because they are often maladaptive and intense,long standing and do hamper a persons' day to day functioning. These are categorized as Anxiety disorders and Mooddisorders .

Anxiety is a feeling of fear, nervousness ,panic and worry. It is an adaptive response needed while facing danger.We may often feel anxious in response to certain situations like an upcoming exam or speaking in public.However, at times we may feel that anxiety is taking over our life. Anxiety disorders are of many types namely Generalized anxiety disorders, Phobias, Panic Disorder,Obsessive Compulsive Disorder.

Depressive and bipolar disorders are disorders of mood.We are sad or happy in response to various situations. Crying when we encounter a sad situation or being happy because we won a prize are expected.

However, if the mood states begin to dominate our lives and we experience long spells of highly intense happy or sad days we could be suffering from a mood disorder.These mood states dominate our lives and prevent us from going about our day to day life. A very sad mood with feelings of helplessness and even thoughts of suicide would indicate a depressive disorder. Excessive grandiose thinking and inflated self-esteem with boundless energy which leads to poor day to day functioning would indicate a bipolar disorder including mania. Often moods alternate between extreme highs and extreme lows. If a person is constantly sad,crying and even thinks of suicide it would point to a depressive disorder.

People suffering from mood and anxiety disorders are commonly seen in psychiatric clinics .

These conditions are normally treated with a combination of psychotropic medication and various forms of psychotherapy.