

The Neuroscience of Identifying Emotions and Feelings

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1. Introduction - 178 words

We can all notice our own emotions. We can even notice how our cat or dog is feeling. Yet there is often debate in the scientific community on the difference between feelings and emotions. In the research of applied neuroscience we have found that an emotion is a specific event in the brain. Others argue emotions are psychological, not able to be identified in the brain. The neuroscience about emotions is complicated, and pretty confusing. Let's see if we can clear a few things up.

Let's begin to understand emotions neurologically by asking this question:

Is there a difference between an 'emotion' and a 'feeling'?

Also, what about the difference between emotions, feelings, and mood or affect? The neuroscience of emotions is actually called affective neuroscience. In this article we are going to explore the emotional jungle in the brain to interpret feelings, and how they influence and even change us and our relationships. The exercises and activities will help you *"Train Your Brain, Change Your Mind and Feel Happy"*.

2. Ways to Identify and Label Your Emotions

Why are feelings important to label? Labeling them makes us better at managing and controlling them. By managing emotions we prevent, decisions or behaviors being based on emotions alone. When feeling angry we may react before thinking it over and not being rational. Identifying and then labeling them can be difficult as the words emotion and feeling seem interchangeable to most people. In the introduction, the question was asked:-

Neuropsychologically that's the difference between an 'emotion' and a 'feeling'?

What is your opinion here? Neurologically an emotional response is the reaction to an environment stimulus. A feeling is a subjective (mental) response which occurs when one becomes aware of the physical change - like feeling your heart rate increase or your eyes dilating.

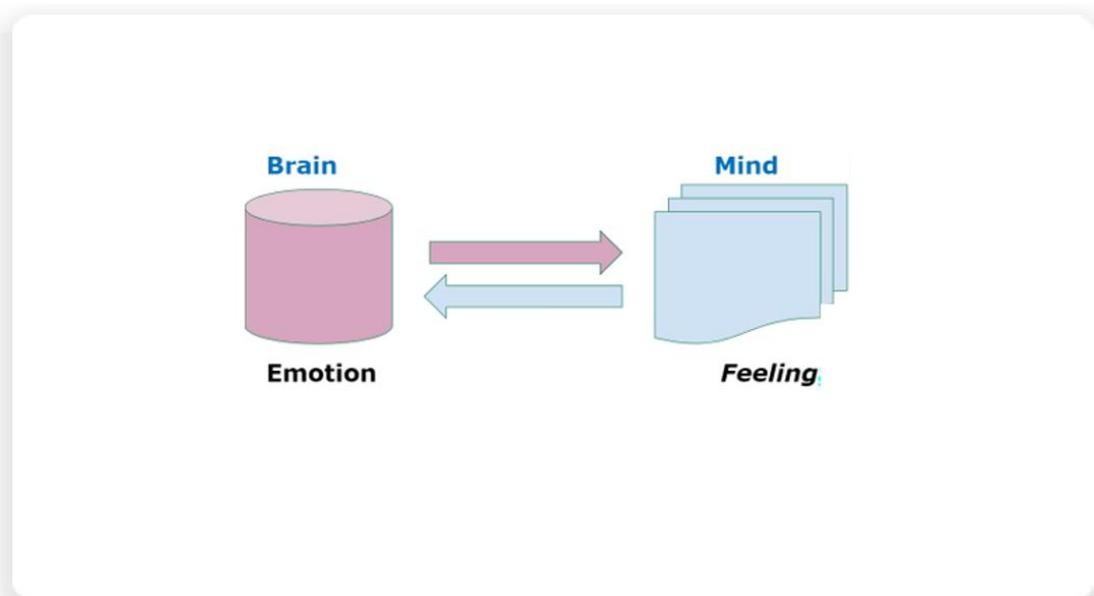


DIAGRAM 1: The brain's emotional response and relationship to mental feelings.

It is important to understand how this automatic emotional process begins. When your brain's fast-pathway is triggered according to Méndez-Bértolo, C, et al (2016), the 'fast pathway' is activated to protect you from harm. It can even be triggered while watching a movie, where a car collision is about to happen. Many people might find their feet pressing down on imaginary brakes under the movie theatre seat. Feelings that follow and are determined by the 'slow pathway' in the prefrontal cortex when the mind consciously notices fear due to the physical or psychological changes. The brain has this automatic emotional response and then the mind consciously notices this as a feeling which can be understood in Figure 1: The brain's emotional response and relationship to the mind, having a feeling. Labeling and emotional response

initially occurs before the mind is conscious of the fear response in the amygdala as per Figure 2. Labeling feelings is much easier. We have thousands of words for how we might feel.

In **diagram 2** the amygdala, in yellow, is considered the “fear center” or “emotional center” of the brain. And once your amygdala’s arousal is psychologically processed, then your mind will notice feelings, like being cut off in your car, you first have the shock and then a moment later, feel anger or relief etc.

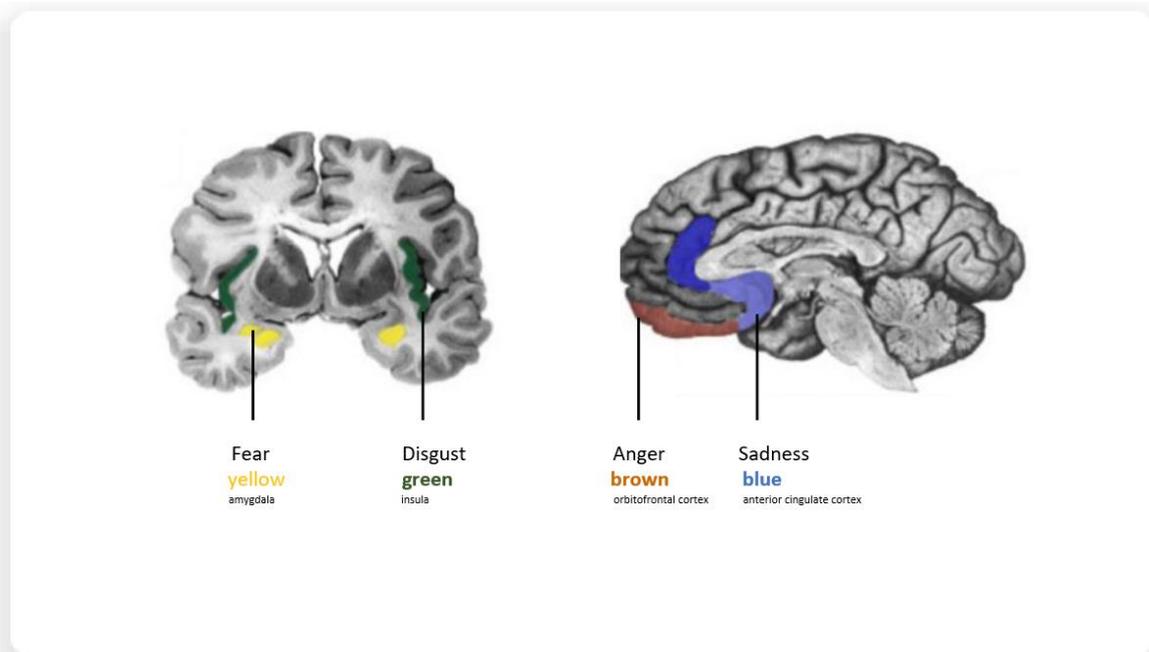


DIAGRAM 2 Locationist Hypotheses of Brain–Emotion. Anatomy associated with core emotions So what about Emotional intelligence (EI) the ability to notice own emotions, and other people? Research by Ekman. P, et al 2008, and many important EI researchers proposed there are 7 culturally universal emotions that all people have. Below are the 7 emotions proposed by Ekman et al, 2008:

- 1) Fear.
- 2) Anger.
- 3) Disgust.
- 4) Sadness.
- 5) Surprise.
- 6) Contempt
- 7) Happiness.

These are the core emotions and you can use them to label how you feel. Ekman proposes that any feeling will fall into one of these 7 categories that are universal. Neurological research Adolphs, R (2014) proposes fear as the primary emotion. But what about feelings and where do they fit in? The answer lies in the neurological study of emotion or affect. This area of research is called Affective Neuroscience and is the research of the brain’s system of emotion. This interdisciplinary research syndicates neuroscience, psychological study of emotion, cognition, feeling and mood. Affective neuroscience (A.N.) research seeks to understand the

underlying experience of feeling, emotion or mood. This includes the study of emotional experience and the awareness of other people's emotions.

The processes of emotionally-driven behaviour, decision-making, attention and self-regulation, as well as the underlying neurophysiology of emotions is relevant here. The most useful information from A.N. is understanding that emotions and feelings are understood as being on one continuum. Affect is your brain's basic emotional arousal and when you have a felt experience this emotion is then considered a much more psychologically complex. So the words "emotion" or "feeling" really mean "affect". There is now no need to distinguish between the two. This is even more important in the understanding that cognition and emotion are part of the same process as is memory and mood.

Basically we are now back to basics! The research suggests that all the neuropsychological functions do not exist in isolation or without emotion. This is clearly explained in the paper 'Affect is a form of cognition: A neurobiological analysis' (2008) by Seth Duncan and Lisa Feldman Barrett.

Let's now look at how to intelligently manage feelings (or now we can call affect).

3. Useful Worksheets

Using the worksheets will help you become more effective and labeling and managing affect (your emotions and feelings). As mentioned there are many models of emotional intelligence. The key theme is that they usually all refer to four domains: self-awareness, self-management, social awareness, and relationship management. Daniel Goleman, includes motivation in his model emotional intelligence, and refers to five key elements which are excluded here as being part of regulation: Self-awareness. Self-regulation. Empathy. Social skills.

These worksheets have shown to be very useful to improve emotional wellbeing. See PDF for the worksheets referenced below.

3.a. The Rate Worksheet

- Use the RATE worksheet to understand, and improve your emotional intelligence and overall wellbeing by applying this much-researched approach (Kennedy. J.J., 2019). To notice healthy or unhealthy emotional responses and to express feelings in a respectful way that help others to understand you

3.b. The EQ 5 Point Tool

- Use this the EQ 5 Point Tool Formulation worksheet to distinguish between unhealthy (or problematic) and healthy (or target) emotional responses. In the worksheet you can learn how to apply this tool to resolve conflict and improve your social and emotional intelligence . It can help make others and yourself clearly understood.

3.c. REBT Formulation Worksheet

- Use this REBT Problem Formulation worksheet to distinguish between unhealthy (or problematic) and healthy (or target) emotional responses.

3.d. Love Letter to Myself.

This is probably the most important activity or exercise! The purpose is for you to identify your many great qualities and how they benefit you. You also will come up with ways to practice your strengths in daily life. This self-love exercise will help you to focus on your best traits, abilities and talents. In doing so, you are on your way to becoming a more self confident and resilient individual. <https://positivepsychology.com/self-care-worksheets/>

- See PDF for worksheets

4. Activities for Emotion Identification and Labeling

Think of an emotional event in your recent past. It can probably be associated with one of these 7 core emotions in the **figure 3** below. It is always surprising by how well it actually works. Try it out. Think of a feeling and notice how easily it can be associated with one of these core emotions.

As mentioned an emotional response is a pre-conscious event. In fact we can notice an emotional response of emotions on the face of others sometimes even before they are aware. As one laughs or cries emotions are put 'on display'. This allows us a moment to glimpse into the emotional minds of others. This is called FACS - Facial Affect Coding, a system that shows how to "read" face-based emotional changes already used by Disney and many others.

These expressed emotional states can be detected in real time. See if you can detect facial expression and have the human emotion coding skills to capture raw, unfiltered emotional responses towards any type of emotional engagement. What are these emotions? And which of the 7 is excluded? See the attachment for the activity details.



DIAGRAM 3: Facial Affect Coding System to “read” face-based emotional change.

- See PDF for worksheets

5. Teaching Children About Emotions: Lesson Plans

Teaching Children about emotions is invaluable for their healthy development, but even if you don't have kids - the movie *INSIDE OUT*? It's now on Netflix in many countries. The movie is a great way to help understand how your mind has different ways of thinking about emotions. Research by Salas. C., et al, 2012 compared internally generated and externally generated Basic emotions. The movie is about Riley a, a happy, 11-year-old girl, who has her life turned upside-down when she has to move with her parents. Riley's emotions – inside her head –try to guide her through this difficult time. The movie brings the emotion of 'Sadness' to the front of her mind. And her 'Joy' emotion is swept away. Then the emotions of 'Fear', 'Anger', and 'Disgust' come into play. The story shows how she learns to control how she is feeling. Please show your kids – and even watch it again. This movie helps teach kids – and you - more about managing emotions?

To understand how the movie impacts emotional wellbeing. Subjective impact, meaning making, and current and recalled emotions for self-defining memories, Wood WJ, and Conway M. (2006) completed a study that shows by recalling personal emotional will generate more negative emotions, which might account for the overall higher intensity of the internal mood induction. Emotions can be generated by film clips, pictures, and movies. In their research children watched film clips (external procedure) and recalled personal events (internal procedure) inducing 4 basic emotions (fear, anger, joy, sadness) which were later compared. Joy was more intensely experienced but negative emotions are better remembered.

6. Fun Games and Ideas for Children

Here is an outline of how to teach children about emotions. As a parent or caregiver, it is important to congratulate them when they were able to self-regulate. Keep your eye out for 'Teachable Moments' to increase their emotional awareness in themselves and others. And do the same. Children model us.

Lesson Plan 1: Inside Out Game

A fun game is to have small children (around 3 or 6 years old) to imagine they are Riley and act out what it feels like to be each emotion. Play with them and say:

I am going to be 'Sadness' tell me if you think I look sad.

And then jump around being and looking happy (even a little silly). Many children laugh here and say you are not being 'sadness' you are too happy!

Then ask them to do it in the right way and go through each emotion. Remember fun is the best learning tool so focus on them enjoying the activity. Goofing around helps.

Lesson Plan 2: Meal Time.

During mealtime, you can share a story that makes you feel a certain emotion like feeling happy, angry, sad, or envious, etc.). Then simply ask the kids what made them feel happy, then go on to angry etc. Add more complex emotional words like envious only later if the lesson is met with enthusiasm. This approach helps a group of children to start speaking about how they feel and what emotion that may have on others..

Lesson Plan 3: The Feeling Song

<https://www.eslkidstuff.com/lesson-plans/feelings-and-Emotions.html>

The Feeling Song children can practice talking about some simple feelings and emotions. Children play drawing and flashcard games, sing a song, read an interesting story and do a matching activity worksheet. Learning the song has several phases starting with teaching the emotional vocabulary followed by drawing emotional faces that match the labels. Once the practicing is complete it is time to teach the song.

It can also be good to print flashcards for the following words: sunny, rainy, eat, noisy, stormy, sleep. Hold up the card, and say the word and do the action and have everyone copy your gesture. Once these activities have been completed, practice actions of the song. Play the song once and have all the kids look at the pictures on the board (point as the song plays) and do the actions. Next, play the song again and sing along, encouraging everyone to sing as they do the actions. Now you can all together sing "The Feelings Song" Now you can all sing "The Feelings Song" (**download MP3 here**).

7. Mindfulness, Meditation and Emotions

It is often asked if mindful meditation alters brain responses to negative emotions. In 2018 Magalhaes. A., etal, completed Systematic review and explain how meditation alters the brain and how ensure emotion regulation Various neurological changes were found in the dorsal anterior cingulate cortex (associated with self-regulation), the insula (associated with physical awareness), the dorsolateral prefrontal cortex (improvement of metacognitive skills), and the default mode network, which is the most active brain system when the brain engages the

'Relax Response' Benson, H (1974). Self-regulation seems to be the key by which meditation improves emotional wellbeing (Hölzel et al., 2011; Tang et al., 2015).

Further the amygdala is associated in processing of negative and positive emotional stimuli (Vuilleumier, 2005). Furthermore, amygdala and insula, as well the ventromedial prefrontal cortex, and ventral anterior cingulate cortex have been involved in emotional processing (Phan et al., 2002; Phillips et al., 2003).

In the organizational and professional contexts mindfulness meditation has shown to have profound effects on wellbeing and cognitive functioning as per the research presented at Harvard Medical School (IOC) by Kennedy, J (2016) along with the workshop result with the Thai Bhuddist Monk, Punnadhammo in the diagram below.



DIAGRAM 4: Thai Bhuddist Monk, Punnadhammo and Dr. Justin James Kennedy at a corporate Mindfulness Workshop in Dubai.

(Download MP3 Positive Psychology Mindfulness Audio here).

8. Books on Emotions, Feelings and the Brain

1. Brain Reboot: A Change of Mind Will Change Your Brain Kindle Edition - by Dr. Justin James Kennedy (Author), Marshall Goldsmith (Foreword)

https://www.amazon.com/Brain-Reboot-Change-Mind-Will-ebook/dp/B07P8F726L/ref=sr_1_fkmr0_1?dchild=1&keywords=Dr.+Justin+James+Kennedy+%282019%29+BRAIN+REBOOT&qid=1592838942&s=digital-text&sr=1-1-fkmr0

2. The Well-Tuned Brain: The Remedy for a Manic Society 1st Edition. Whybrow

- . https://www.amazon.com/dp/B00NUB4ETO/ref=as_at?tag=fivebooks001-20
3. The Emotional Life of Your Brain: How Its Unique Patterns Affect the Way You Think, Feel, and Live 2012 by Richard J. Davidson. <https://www.amazon.ca/Emotional-Life-Your-Brain-Live/dp/0452298881>
 4. The Language of Emotions: What Your Feelings Are Trying to Tell You 2010 by Karla McLaren. https://www.amazon.ca/Language-Emotions-What-Feelings-Trying/dp/1591797691/ref=pd_bxgy_img_2/131-5267356-6780412?encoding=UTF8&pd_rd_i=1591797691&pd_rd_r=8a25f090-ffc9-4b44-a849-8995f05ae101&pd_rd_w=6HcOZ&pd_rd_wg=j8deu&pf_rd_p=62bc58f5-5a07-4a59-9b91-fe01cc96db2b&pf_rd_r=EX37JKFCN6259VGBVGBV&psc=1&refRID=EX37JKFCN6259VGBVGBV
 5. The Emotion Machine: Commonsense Thinking, Artificial Intelligence, and the Future of the Human Mind 2007 by Marvin Minsky (Author). <https://www.amazon.com/Emotion-Machine-Commonsense-Artificial-Intelligence/dp/0743276647>
 6. Mind: Mind Control: Over Negative Emotions And Thoughts: Emotion: How To Eliminate Negative Self-Talk And Permanently Stop Negative Feelings (Anger, Fear, Senses, Feeling, Mental, Happiness, Joy) by D.D. Tai (Author) <https://www.amazon.com/Mind-Eliminate-Self-Talk-Permanently-Happiness-ebook/dp/B00RPYZWLG>
 7. F--k Your Feelings: Master Your Mind, Accomplish Anything and Become a More Significant Human by Ryan Munsey . <https://www.amazon.com/dp/B07HS1HTVZ/ref=dp-kindle-redirect?encoding=UTF8&btkr=1>
 8. The Emotional Brain: The Mysterious Underpinnings of Emotional Life by Joseph E. LeDoux
. https://www.goodreads.com/book/show/780672.The_Emotiona_Brain
 9. The Feeling Brain: The Biology and Psychology of Emotions by Elizabeth Johnston
. <https://www.amazon.com/dp/B00FQUDPHE/ref=dp-kindle-redirect?encoding=UTF8&btkr=1>