

## **From the Guardian**

### **More than a feeling**

**All emotions - negative and positive - have their use. But how are they formed? And how can we control them? Psychologist and broadcaster Claudia Hammond explores where emotions come from and explains how fleeting facial expressions often reveal our truest thoughts ...**

**Claudia Hammond**

**The Guardian, Saturday 7 March 2009**

Each emotion is both wiser and more useful than we might think Photograph: Guardian

Facial expressions don't just tell us how a person feels; they indicate what someone is about to do and how they expect you to respond. An angry glare from a parent tells children to stop squabbling. A sympathetic smile from a stranger shows they are about to help us, not hurt us. In any face-to-face conversation we watch every movement of a muscle in the other person's face without even thinking about it. Even a two-week old baby can distinguish between expressions of sadness, happiness and surprise. Yet it is only in recent years that we have begun the study of emotions in earnest; and come to realise what a vital tool they are to achieving a greater understanding of ourselves and other people.

How useful are emotions?

By examining emotions more carefully, using the latest research from neuroscience and psychology, it becomes clear that each emotion is both wiser and more useful than we might think. Emotions provide us with a ready-made way of responding to a situation without having to work out from scratch what we should do. This is why they can appear to hijack us so quickly: when we suddenly burst into tears, or find ourselves losing our temper uncontrollably.

But every emotion has its purpose, even the negative ones. It is easy to see why fear keeps us safe by alerting us to danger and readying the body for fight or flight. Likewise disgust induces us to recoil at the sight of faeces or vomit, thus protecting us from disease. The usefulness of emotions such as sadness and anger, though, is harder to appreciate. In fact sadness, like every emotion, gives us information. If we didn't feel sad when a relationship or a job was proving fruitless, why would we ever seek to change anything? And in the right place, at the right time, anger can be essential. Where would civil rights campaigners be without the anger that spurs them into action?

Using MRI scans, researchers are investigating how the brain processes each emotion, but this new understanding of the relationship between chemicals in the brain and the way we feel does not mean that we are doomed to be ruled by our emotional brains, programmed with immutable responses to every situation.

Events in the outside world, and even the way we choose to think about those events, can still influence the brain's chemical responses. Scanning allows us to see which areas of the brain are activated and which are deactivated when a particular emotion is experienced, but unfortunately there are no neat answers; different combinations of different brain systems seem to be responsible for each emotion.

### The new science of emotion

Before the advent of brain scanners, emotions were relatively neglected within academic psychology, considered too private and subjective a topic for rigorous research. But in the past 15 years, research on emotions has mushroomed. Psychological research has plenty to tell us about why we experience emotions and how to detect what others are feeling.

Researchers have tried everything from pouring apple juice into brand new bed pans to see whether subjects will drink them (to investigate the psychological power of disgust), to creating spectacles with miniature buckets suspended beneath them in order to catch the tears of an audience during a sentimental film (to investigate the possible presence of a

chemical explanation for the fact that most people say they feel better after a good cry).

Where do our emotions come from?

There is still debate over whether we have evolved to feel each emotion, or whether they are socially-driven, with societies constructing emotions as required, along with rules as to the appropriate time and place to express them (such as not crying at work).

Rates of crying vary considerably around the world, for example. The US tops the crying charts for both men and women, while Bulgarian men and Icelandic and Romanian women claim to cry the least.

Then there's the cognitive approach, which stresses that every emotion arises from our interpretation of a particular situation. Here emotions are considered to be signals, to ourselves and to others, and it's the meaning we give to an event that matters. Unless you have a phobia, your reaction to a snake in a tank at a zoo will be very different to that of finding one in your sleeping bag in the jungle. Emotional responses might feel instantaneous, but in fact, in a fraction of a second, we have made an assessment of the situation which informs our reaction.

Researchers don't even agree on a list of basic emotions: anger, surprise, fear, sadness, joy and disgust usually make an appearance, but others extend the list to include contempt, guilt, excitement, anticipation and trust. Some define a basic emotion by its association with a unique facial expression, an idea mooted by Charles Darwin in his bestselling 1872 book, *The Expression of the Emotions in Man and Animals*.

After the birth of his first child, Darwin documented each new facial expression he observed. His theories weren't always correct. He proposed that tears were produced to protect the eyes when we screwed up our faces, and even had his children scrunch up their faces for 40 minutes at a time in the hope of demonstrating his theory. But he was correct in his proposal that the face is key to revealing emotion.

Facial coding

More than 130 years later, marketing companies are using "facial coding" to try to ascertain what consumers really think of a product as opposed to what they say they think about it. The idea is that however good we believe we are at arranging our faces so as to disguise our feelings, for a millisecond our faces will reveal our genuine emotions. Slowing down a video reveals these fleeting micro-expressions, but those who have been trained can spot them in real time.

One authority on this topic is US psychologist Paul Ekman, author of *Emotions Revealed*. The good news is that he believes we can all train our brains to recognise emotions more accurately.

Our ability to read faces is controlled by the amygdala deep inside the brain, and it is key to our understanding of other people, as well as our ability to get on with others. We all tend to like people who appear to have a natural empathy, and they are often the same people who are good at reading faces.

Some elements of facial expressions are obvious - when a person feels sad the corners of the mouth turn down, but if they're trying to conceal their distress their eyelids droop and there can be a lack of brightness in the eyes, which you might have ascribed to boredom or sleepiness. The face for disgust can be hard to distinguish from anger, but the wrinkles at the side of the nose give it away. The nostrils narrow, the upper lip rises, the lower lip lifts and protrudes slightly, the cheeks rise, and the brows come down together creating crow's feet around the eyes.

### Detecting fake emotions

Babies as young as 10 months can fake a smile when handed to a stranger; they already seem to know that fake smiles have social uses. But Ekman has tips for distinguishing a fake smile from the real thing. There's a muscle called the orbicularis oculi, which pulls the eyebrow down at the same time as raising the cheeks and pulling up the skin below the eye. To judge whether a smile is genuine, look to see whether the cheeks go up while the eyebrows tip down slightly. Only

10% of people can contract the outer part of this muscle at will.

Every emotion has its place. Understanding its purpose and learning to read it can help to reduce its mystery. Each experience of a strong emotion can give you information. By distinguishing the precise emotion you are feeling you can begin to work out your true feelings.

On occasions, our anger serves us badly and can even have appalling consequences, but most of the time our emotions serve us well, even in the most extraordinary situations. Mark Henderson, who spent three months as a hostage in the Colombian jungle, wrote in his diary that one night, after three days of a diet of lentils and beans, he and his fellow hostages laughed themselves to sleep at their own flatulence. This is the perfect example of emotions helping us through.

Further reading

- For a key guide to emotions and their expression read Paul Ekman, *Emotions Revealed* (Weidenfeld & Nicolson)
- Randy Cornelius, *The Science of Emotion* (Prentice-Hall)

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- Charles Darwin, *The Expression of the Emotions in Man and Animals* (HarperCollins)

- Antonio Damasio, *The Feeling of What Happens* (Vintage)
  - Joseph LeDoux, *The Emotional Brain* (Simon & Schuster)
  - Paul Martin, *Making Happy People* (Fourth Estate)
- About your expert

Claudia Hammond is a psychologist, broadcaster and lecturer. She presents *All in the Mind*, *State of Mind* and *Mind Changers* on BBC Radio 4 and *Health Check* on BBC World Service. Her first book, *Emotional Rollercoaster: A Journey Through the Science of Feelings*, is published by Fourth Estate.