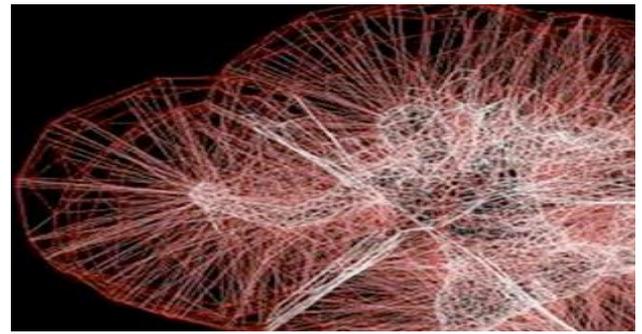


## The science of embodiment

Embodiment is the study of the subjective aspect of the body. If the standard medical model sees the body as an object – a thing – embodiment concerns the body as who we are: an ‘I’. It is about our felt experience of the body ‘inside-out’ and application of this to wellbeing, relationships, leadership, etc. By definition, embodied or somatic knowing has a first-person perspective on the body and scientific understanding of the body a third-person or objective understanding. While both are empirical (based in experience), embodied knowledge is somewhat counter-cultural in the Western world since scientific understanding is generally privileged and first person experience ignored or considered in need of validation. For this reason, people on business embodiment courses will sometimes say, ‘well that feels right, it’s useful too, but what’s the evidence?’ First-person evidence alone is not trusted, and studies and academic proof is sought. Happily, there is now a weight of scientific evidence related to this area and the two ways of understanding the body seem to be increasingly coming together. In a similar way, mindfulness was at one time a largely esoteric Buddhist discipline, and is now supported by a wealth of Western scientific literature showing its effects on stress, as well as various objective neuroscience measures of brain function such as using MRI and PET scans. Jon Kabat-Zinn is the name most associated with this validation movement. Embodiment is perhaps being ‘made respectable’ by scientific establishments in a similar fashion.



### The body-mind link

An embodied or somatic paradigm takes the position that mind and body are closely linked. Even a conventional dualistic viewpoint would struggle to show that the body and mind are separate. For example, what was once called ‘psychosomatic illness’ is now called ‘medically unexplained symptoms’ (MUS). MUS is an established field with numerous specialists. In the UK National Health Service, Professor Helen Payne has shown how dance movement therapy (DMT) – a form of embodied practice – can help alleviate MUS. Perhaps dance movement and body psychotherapy are now establishing the validity of their work in the same way that cognitive behavioural therapy (CBT) has done. On that note, while CBT is known for articulating thinking strategies, the ‘behavioural’ aspect is very aligned with embodied practice.

Another classic body-mind link is the placebo effect, where belief that a sugar pill is a medicine when it’s not leads to beneficial medical effects. The placebo effect is powerful and something that has to be rigorously controlled in double-blind pharmaceutical studies. Similarly, brain scans of various kinds have shown that asking people to think about different things, imagine things or meditate changes blood flow, and neurotransmitter and electrical activity in the brain. This is common sense: there is a physical basis to any subjective act – it’s not magic. It is beyond doubt that mental activity can affect the brain and more generally, the body (the ‘brain’ is actually diffused as we shall see) – but what about the other way around?

## The body and emotions

Perhaps the grandfather of embodied scientists is William James, who, along with Carl Lange, came up with the notion that physiological arousal is what leads us to experience an emotion, not the other way around. Later, experimenters found emotion could be induced through adrenaline shots (though interpretation of context is also vital). The idea of emotions as bodily phenomena as well as mental phenomena makes sense to most people. Even people with low levels of bodily awareness can describe the bodily component of the fight-flight response. The physiological correlates of subjective emotion are relatively well documented. Richard Wiseman refers back to James' work in his book, *Rip it Up*, showing how personal development is best done not with positive thinking but with physical action. An article of his in the Guardian newspaper ([www.guardian.co.uk/science/2012/jun/30/self-help-positive-thinking](http://www.guardian.co.uk/science/2012/jun/30/self-help-positive-thinking)) collates much useful information and is almost a simple reinvention of embodied practice. Examples Wiseman quotes include James Laird finding that when people are made to smile (for example by holding a pen between their teeth) they become happier, and that when people are asked to nod they agree more. Other examples include research by Chen-Bo Zhong from the University of Toronto, who discovered that people who carried out an immoral act and then cleaned their hands with an antiseptic wipe felt significantly less guilty than others (<http://science.sciencemag.org/content/313/5792/1451>). Weighing up two sides of an argument has been shown to be embodied by swaying on a Wii Balance Board ([www.spring.org.uk/2013/01/sway-the-psychology-of-indecision.php](http://www.spring.org.uk/2013/01/sway-the-psychology-of-indecision.php)). Hung and Labroo found that willpower is linked to contracting muscles ([http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1790324](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1790324)).

That there are postures associated with certain mental and emotional states is unquestioned, but what has only recently been proven is that this link goes both ways. For example, not only can being depressed make us slump and our facial expressions change, but slumping and changing our facial expressions can make us depressed. Dr Paul Ekman found out the latter while having researchers take on certain facial expressions. It takes some practice to make emotional expressions accurately and he found those making expressions for hours felt the emotions they were 'faking'. Of course, many actors have found the same thing.

Amy Cuddy and colleague Dana Carney found something similar with postures and discovered that the hormones cortisol and testosterone were mediating this. When people sat or stood in expansive, dominant 'power poses' even for a few minutes, it changed their hormonal make up which changed how they felt, how they communicated and how they were perceived by others (for example, in job interviews).



## Movement, psychology and personality

As well as expressions and postures, movement is also being studied as something which can change mental events and decision making. Dr Peter Lovatt at the University of Hertfordshire (known affectionately as 'The Dance Doctor'), has shown that different types of dancing facilitate different kinds of thinking and problem solving, and can increase or decrease risk-taking behaviour. Again there is a link between the way people dance, the way they generally move, and hormone levels.

There is research on the connection between movement style and personality type from Dr Luck in Finland

([www.jyu.fi/en/news/archive/2010/11/tiedote-2010-11-26-11-19-02-026660](http://www.jyu.fi/en/news/archive/2010/11/tiedote-2010-11-26-11-19-02-026660)). Using movement and postural patterns as a way of quickly judging personality (a type of 'thin-slicing') is something we all do. Dogs do it, kids do it and for better or worse, adults do it, as this study shows. Here's a video of me playing with assessing people's personalities from movement on Brighton-sea front in a fun but unscientific way

([www.youtube.com/watch?v=K5CUKznWfsc](http://www.youtube.com/watch?v=K5CUKznWfsc)). There are many opportunities here, as embodied schools from Reich and Laban onwards have models that could be tested against personality psychometrics relatively easily. With modern motion capture technology, a valid video-only psychometric could even be developed. Such a validated measure would help distinguish between projection of stereotypes and accurate assessments. A visual motion capture personality metric could also be of great use to animators and computer games companies in designing characters. The FEBI is perhaps the only validated psychometric which incorporates any theory on movement style at all, which is strange as some researchers go so far as to say we have brains to move: organisms that don't move, like plants, don't have them

([www.ted.com/talks/daniel\\_wolpert\\_the\\_real\\_reason\\_for\\_brains](http://www.ted.com/talks/daniel_wolpert_the_real_reason_for_brains)). From an embodied perspective, movement is core to who we are and how we operate.

## Embodied cognition

Many of the studies showing the influence of posture and movement on thinking are not a surprise, considering the notion of embodied cognition. Found in both philosophy and robotics, it states that thinking is dependent on (human or robotic) bodily feedback and more broadly, on the wider environment. This article is a good introduction:

<http://journal.frontiersin.org/article/10.3389/fpsyg.2013.00058/full#B43> Much of this is summed up in this quote: 'the brain is not the sole cognitive resource we have available to us to solve problems'. Lakoff and Johnson are well known writers in this field.

Other researchers found that people holding warm mugs of coffee rate others as warmer people and become more generous themselves ([www.npr.org/templates/story/story.php?storyId=96041598](http://www.npr.org/templates/story/story.php?storyId=96041598)). Joshua Ackerman at the MIT Sloan School of Management found that participants who sit on either soft or hard chairs had differences in negotiation styles. The change in body state changes the thinking and the behavioural tendency. Such studies point to what embodiment trainers observe: that the environmental and habitual personality influenced body state, is the substrate of thinking, perceiving, acting, relating etc. Such studies are just the tip of the iceberg.

## Evidence for centring and relaxation techniques

State management through various techniques involving posture, movement, breathing, visualisation and awareness are the basic tools of the embodied trade, sometimes called 'centring', 'grounding' 'tuning-in' etc. In scientific literature, these may be referred to in a somewhat reductionist fashion as 'relaxation techniques' and there is evidence such techniques can alleviate many conditions

(<https://nccih.nih.gov/health/stress/relaxation.htm>).

Given how widespread such techniques are, even in the mainstream, it is surprising that there are very few studies comparing the effectiveness of different techniques, especially for short-term efficacy (here is one:

[www.academia.edu/686540/Comparison\\_of\\_Long-term\\_Effects\\_of\\_Two\\_Types\\_of\\_Relaxation\\_Techniques\\_on\\_Choice\\_Reaction\\_Time\\_and\\_Selected\\_Psychophysiological\\_Variables\\_Following\\_Repeated\\_Sub-maximal\\_Intensity\\_Exercises\\_in\\_School\\_Level\\_Athletes](http://www.academia.edu/686540/Comparison_of_Long-term_Effects_of_Two_Types_of_Relaxation_Techniques_on_Choice_Reaction_Time_and_Selected_Psychophysiological_Variables_Following_Repeated_Sub-maximal_Intensity_Exercises_in_School_Level_Athletes)). A problem here is that certain techniques may have very different – even opposite – effects, depending on how they are done. Take 'deep breathing' for example: if the out breath or in breath is lengthened, or if the 'deep' breath is done with the chest as opposed to the belly (diaphragm), there will be differing effects. The research in this area is supportive to embodiment practice, but lacking depth, and with room for further studies.

## Neuroscience and embodiment

The relationship between embodied approaches and neuroscience is now also being explored. Amanda Blake is a specialist

(<http://www.stonewaterleader.com>) and Wendy Palmer's latest book is a good introduction. For those wanting to go deeper, Antonio Damasio and Stephen Porges are recommended. Their Polyvagal theory is extremely suggestive. While one also has to be careful of 'neurobunk' and using a discipline selectively to meet an end, there are many ideas from neuroscience that give weight to the embodied training approach. For example, the impact of implicit procedural learning and the importance of conscious practice to overcome engrained circuitry and habits. Neuroscience shows us how reading books is not enough to change our behaviour as we are neurologically disposed to certain emotionally linked behaviours. Neuroscience shows how the amygdala can 'hijack' the brain, effectively 'turning off' the neocortex in fight and flight responses, necessitating techniques such as centring which enable us to regain use of our more rational neocortical areas of the brain. Even a primitive Triune brain model can be very useful in explaining embodiment

([https://en.wikipedia.org/wiki/Triune\\_brain](https://en.wikipedia.org/wiki/Triune_brain)).

Neuroscience also describes how the heart and gut have large numbers of neurones, sometimes even called secondary 'brains', and this is relevant to embodied work. Nerves are distributed throughout the body and our whole nervous system is linked; as Amanda Blake says, 'your body is your brain.'

Neuroscience highlights the social relational nature of the human nervous system and why the learning through interaction and community found in embodied approaches is so powerful. By way of contrast, remember the Romanian orphans for the psychical and mental ill effects that can occur when touch, movement and social interaction are not present

([https://en.wikipedia.org/wiki/Romanian\\_orphans](https://en.wikipedia.org/wiki/Romanian_orphans)).

## Trauma and the body

The field of trauma was one of the earliest areas of psychology to recognise the importance of the body and also deserves mention in its own right. Bassel van der Kolk, in his seminal article 'The Body Keeps the Score' brought this area to attention and he has shown the efficacy of working with the body ([www.traumapages.com/a/vanderk4.php](http://www.traumapages.com/a/vanderk4.php)). Other scientifically orientated 'embodied' trauma specialists include Pat Ogden and her Sensori Motor approach, Peter Levine (somatic experiencing), Babette Rothschild and David Bercheli (TRE). It is now established that trauma and related disorders such as PTSD are not purely mental phenomena.

## Conclusion and barriers

This is a brief overview of some of the research relating to embodiment. There is a growing academic evidence base for the work, and much of what is here didn't exist ten years ago. Mutual understanding between academic psychology and those expert in working with the body in the flesh, can only be a good thing. It's worth mentioning the main barriers that could hinder the scientific understanding of embodiment:

- ▶ Prejudice from scientists who have gone through an extremely disembodied education system and have been taught not to value the body. As one academic friend of mine put it, 'my body is just a cart that gets me from one classroom to another.' If mindfulness had an uphill battle against prejudice towards Eastern methods, 'bodyfulness' certainly will.
- ▶ Defensiveness from embodied practitioners, especially those who demonise 'Western science' as oppressive, and charlatans invested in not having their claims actually tested.

Hopefully, the mutual opportunity will bridge the gap between these groups and overcome the difficulties. The opportunity for embodiment practitioners is that we can point to studies to help participants overcome fear of the body and help them enter into their own experience (a 'cognitive bypass'). We can also gain new directions in our work from research. For academics, novel avenues of enquiry that may not be obvious from a purely theoretical perspective can come from working with embodiment practitioners.