Chapter 15

# Empathy versus Compassion

## Lessons from 1st and 3rd Person Methods


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Matthieu Ricard

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Empathy is often misunderstood as compassion

Empathy can lead to burnout, compassion can help foster resilience

Empathy and compassion rely on different biological systems and brain networks

# Empathy versus Compassion

In this chapter, we will focus on describing what we know about the experiential and neuronal bases of empathy and compassion. However, unlike most neuroscientific literature reviews, which usually adopt an exclusively data-driven third-person perspective, we will also add a first-person approach to the description of empathy and compassion research. More specifically, we will describe how we advanced our understanding of the nature of vicarious emotions and motivations such as empathy and compassion by combining knowledge gained from a first-person, subjective experience of a contemplative long-term practitioner (Matthieu Ricard), on the one hand, and objective empirical findings gained from neuroscientific studies (Tania Singer and Olga Klimecki), on the other hand.

The journey began with the initial contact between Matthieu Ricard, a long-term Buddhist meditation practitioner and former scientist, and Tania Singer, a psychologist and neuroscientist, who was working on the neuronal basis of empathy at the Wellcome Department of Imaging Neuroscience in London. In so-called empathy-for-pain experiments, Tania Singer and her team had devised a paradigm in which the brain activity of participants could be measured with functional magnetic resonance imaging (fMRI) while they either experienced painful stimulation themselves or observed another person receiving painful stimulation (Figure1).

**Figure 1.** Setup of an “empathy-for-pain paradigm”. The brain activation of the participant lying in the fMRI scanner is measured while he and other persons seated next to the scanner receive painful and non-painful stimulations to the

backs of their hands. Abstract cues like arrows indicate the intensity of the stimulation and to whom it will be delivered next. Adapted from Bernhardt & Singer, 2012.

When comparing the neural activation elicited during the first-hand experience of pain with the brain activation elicited when merely observing the other person experiencing painful stimulation, the researchers[1] found that both conditions led to overlapping activations in the anterior insula (AI) and the anterior medial cingulate cortex (aMCC). These two brain regions comprise the so-called affective dimension of a pain experience and have been associated with subjective reports of unpleasantness[2]. In line with the “shared network hypothesis of empathy”, these data suggest that we share emotions with others by activating the neuronal representation underlying our own experience of these emotions. Nearly a decade of empathy research performed in different laboratories across the world has now revealed that activations in AI and aMCC have been consistently observed in numerous empathy-for-pain studies, irrespective of whether the other person in pain is a loved one[1] or an unfamiliar person[3], [4]. These findings even hold true when someone merely views a video or picture depicting people in painful situations[2]. Figure 2 depicts the summary results of such a meta-analysis[2], showing activation in AI and aMCC elicited by empathizing with the pain of others.

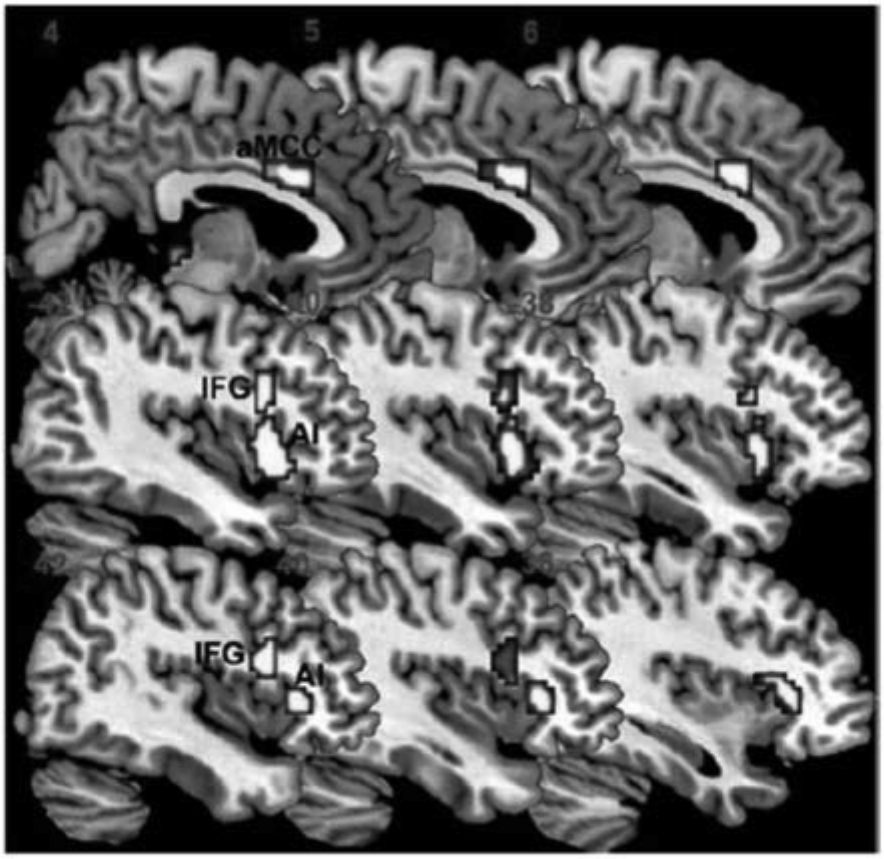


**Figure 2.** Activation when “observing others in pain > observing others in no pain” across nine independent studies. aMCC, anterior medial cingulate cortex; IFG, inferior frontal gyrus; AI, anterior insula (Lamm et al., 2011).

With this background, Tania Singer moved to the University of Zurich, where she started to investigate the plasticity of social emotions by testing whether empathy could be cultivated through training. In this context, she was interested in finding out how empathy was encoded in the brain of an expert meditator who had cultivated such prosocial emotions over many years. Luckily, she had met Matthieu Ricard, a long-term Buddhist practitioner (see Figure 3) in London. Matthieu Ricard had already been involved in many neuroscientific research projects in the context of his association with the Mind and Life Institute and was thus open to this sort of research. Matthieu

Ricard had, for instance, cooperated with the scientists Antoine Lutz and Richard Davidson on projects with expert meditators who were compared to novice meditators. In one of these studies, it was found that when immersed in compassionate states while listening to distressed human voices, expert meditators, but not novice meditators, showed enhanced activations in the insula[5]. In a related paper, Antoine Lutz found that activation in the medial insula was associated with heart rate responses and that this association was stronger for experts than for novices[6].

When Tania Singer and her colleagues embarked on plasticity research, they took their first steps in a cooperative project with the University of Maastricht together with Rainer Goebel and Bettina Sorger, who were using an interesting technology: real-time fMRI. This rather novel technology allows for the online visualization of brain activity while subjects, who are lying in the scanner, engage in different mental activities.

To explore the neural signature of an expert compassion meditator during meditation, the researchers asked Matthieu Ricard to immerse himself in different states of compassion: non-referential compassion, compassion for the suffering of others and loving-kindness. To the surprise of the researchers, all of these states elicited activation in rather similar networks. However, these compassion-related networks did not resemble the empathy-for-pain network described above and so frequently observed in meditation-naïve subjects when exposed to the suffering of others. This was puzzling – here they had an expert practitioner in the scanner and all of the states he produced were so different from their expectations. After the scanning session, the researchers discussed with Matthieu Ricard what he was actually doing when engaging in these different compassionate states. During this exchange, the researchers realized that Matthieu was speaking of a warm positive state associated with a strong prosocial motivation rather than a negative distressing state related to sharing pain.

To test the intuition that empathy for the suffering of another may be very different to developing benevolent or compassionate motivation towards others, Matthieu Ricard was scanned again, but this time asked only to engage in emotionally sharing the suffering of others without going into any form of compassion. And here it was: the researchers outside of the scanner witnessed the appearance of the empathy-for-pain network similar to what Tania Singer and other colleagues had observed many times before in non-practitioners.

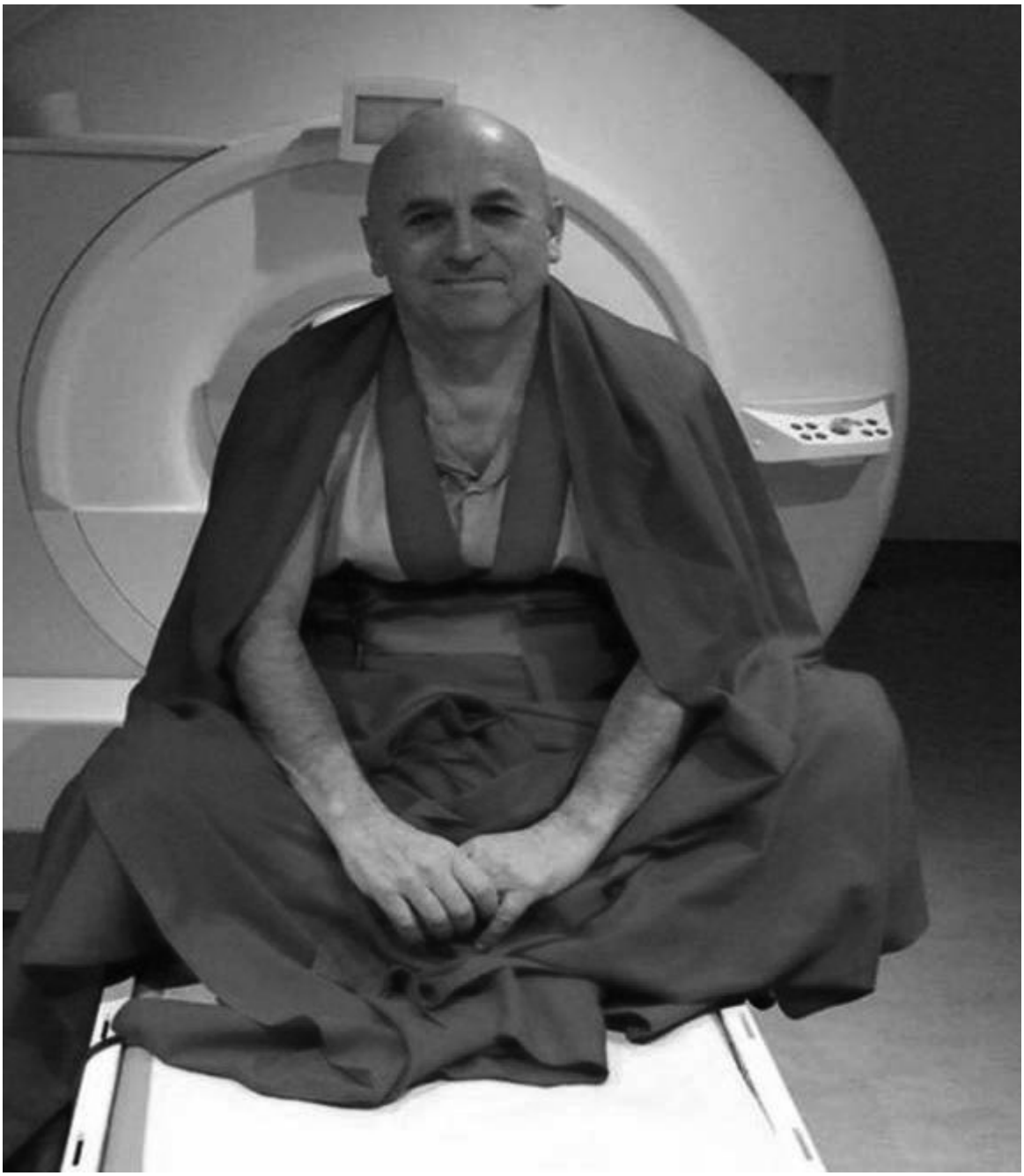

**Figure 3.** Matthieu Ricard, a long-term meditation practitioner, after a brain scan.

**Matthieu Ricard**
**"First-Person Perspective"**

**02:36 min**

“When Tania Singer asked me to go into a state of pure empathy without engaging in compassion or altruistic love, I decided to empathically resonate with the suffering of children in a Romanian orphanage. I had seen a BBC documentary on these totally neglected orphans the night before and was very touched by their fates. Despite being fed and washed every day, these children were completely emaciated and emotionally abandoned. The lack of affection had caused severe symptoms of apathy and vulnerability. Many children were rocking back and forth for hours and their health was actually in such a bad state that deaths were regular in this orphanage. Even when being washed, many of these children winced with pain and the slightest collision could lead to a broken leg or arm. So when I was immersing myself in empathic resonance, I visualized the suffering of these orphan children as vividly as possible. The empathic sharing of their pain very quickly became intolerable to me and I felt emotionally exhausted, very similar to being burned out. After nearly an hour of empathic resonance, I was given the choice to engage in compassion or to finish scanning. Without the slightest hesitation, I agreed to continue scanning with compassion meditation, because I felt so drained after the empathic resonance. Subsequently engaging in compassion meditation completely altered my mental landscape. Although the images of the suffering children were still as vivid as before, they no longer induced distress. Instead, I felt natural and boundless love for these children and the courage to approach and console them. In addition, the distance between the children and myself had completely disappeared. This was when we realized the immense potential of compassion as an antidote to empathic distress and burnout.”

**Empathy and Compassion Training in Non-Experts**

Matthieu Ricard’s first-person perspective conveyed that empathic resonance with the suffering of others was a highly aversive experience. Given these properties, empathy can actually be a precursor for burnout: when empathic resonance with suffering repeatedly induces strong negative emotions, this can be overwhelming[7]. People who work in helping professions (see chapter 6, chapter 12 and Box VI), like caregivers and doctors, are faced with the suffering of others on a daily basis and are at a particularly high risk of burnout. Moreover, distressing experiences are not confined to hospitals and nursing homes – everyone can certainly think of a relative or close friend who at this very moment is suffering from a serious disease or from strong aversive emotions. In fact, everyone can be overwhelmed by resonating too strongly with the suffering of others at their workplaces or in their private lives. Although the strong negative affect that accompanied empathy was alarming, Matthieu Ricard’s first-person perspective also revealed that compassion could help to overcome this pain. From the scientific perspective, compassion seemed to offer a new strategy that enables people to meet suffering with warm-hearted emotions. It actually seemed that compassion would not only benefit the person who felt it by protecting them against burnout, but may also benefit others by increasing helping behavior[8], [9], [10].

And indeed, back in Zurich, the first steps to investigate whether non-experts could be trained in similar loving-kindness enhancing techniques were undertaken. Using a newly developed task, called the Zurich Prosocial Game, the research team measured different types of prosocial behavior in a computer game before and after short-term training in loving-kindness (*metta* in Pali; see metta meditation in Box VII). The team found that training *metta* for a few days increased helping behavior towards strangers and that altruistic behavior increased more strongly in participants who practiced more loving-kindness[11].

In order to study the plasticity of compassion and to investigate the difference between compassion and empathy in participants who had never meditated before, Tania Singer’s Ph.D. student Olga Klimecki and colleagues embarked on a large-scale project. In the course of the

project, she conducted several short-term intervention studies that focused on the training of empathy or loving-kindness and compassion[12],[13]. To reliably determine training-induced changes in participants' response to the distress of others, Olga Klimecki first developed a video-based task[12]. Using this task, each participant's brain responses were measured while they viewed short documentary video clips depicting people in pain or everyday life situations. After each video, participants reported their positive and negative feelings, as well as their levels of empathy. Consistent with many previous findings on empathy for pain[2], the participants' initial empathic responses to suffering were accompanied by activations in AI and aMCC. Moreover, prior to training, seeing others in pain was associated with elevated levels of negative affect and very low levels of positive affect.

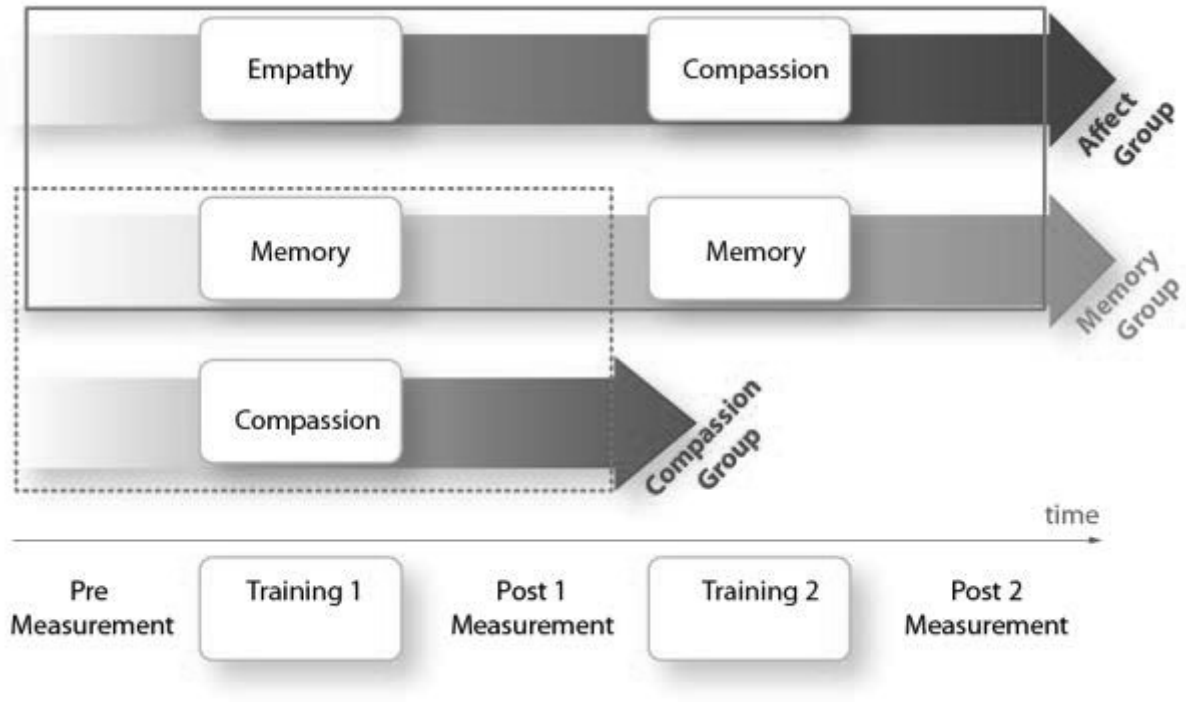


**Figure 4.** Design of the short-term empathy and compassion intervention studies. Participants were assigned to one of three groups based on their temporal availability: the affect group, the memory group and the compassion group. The dotted lines outline the longitudinal study, which compared the effects of compassion training (N = 28) with a matched memory control group (N = 30; Klimecki et al., 2012). Another study (Klimecki et al., 2013) investigated changes induced through training empathy and compassion (marked by a solid line). To this end, data from the affect intervention (N = 25) group were compared to the memory group (N = 28).

After this first measurement, one group of participants received one day of compassion training, while a matched control group received one day of memory training. The control group was included to control for multiple testing and for unspecific training effects (like training in a group, engaging in mental training over days and being involved in a scientific study). Compassion was trained through loving-kindness meditation[14],[15], which relies on sequentially extending feelings of warmth and benevolence to others (see metta meditation in Box VII).

Memory training focused on the Method of Loci, which improves one's ability to memorize sequences of words by associating them with particular locations. To maintain the training effects, both interventions were complemented by additional practice sessions. The comparison of training effects revealed that compassion training specifically increased self-reports of positive affect, even in response to the distress of others (Figure 5). This is remarkable given that the cultivation of compassion induced a positive attitude, which even extended to stimuli showing others suffering. This change in quantitative ratings after each video was paralleled by qualitative first-person reports collected after compassion training in which participants described "the feeling of warmth;

the wonderful, fulfilling feeling of wishing others well; and a feeling of happiness that arises". At the same time, compassion training did not decrease negative affect, which might be a prerequisite for helping behavior: realizing that someone is in need is a necessary first step to taking appropriate action. On the neural level, we observed that compassion training, but not memory training, increased activations in a network previously observed in cross-sectional compassion studies[5],[16],[17], and in brain regions related to positive affect[18] and affiliation[19] as well as maternal and romantic love[20],[21]. This network spans the medial orbitofrontal cortex, the putamen and pallidum and the ventral tegmental area/substantia nigra (Figure 5). Importantly, compassion-related activations in this network were also observed in two other compassion training studies and in the expert practitioner Matthieu Ricard when he immersed himself in different compassionate states (loving-kindness, compassion for suffering and unconditional compassion).

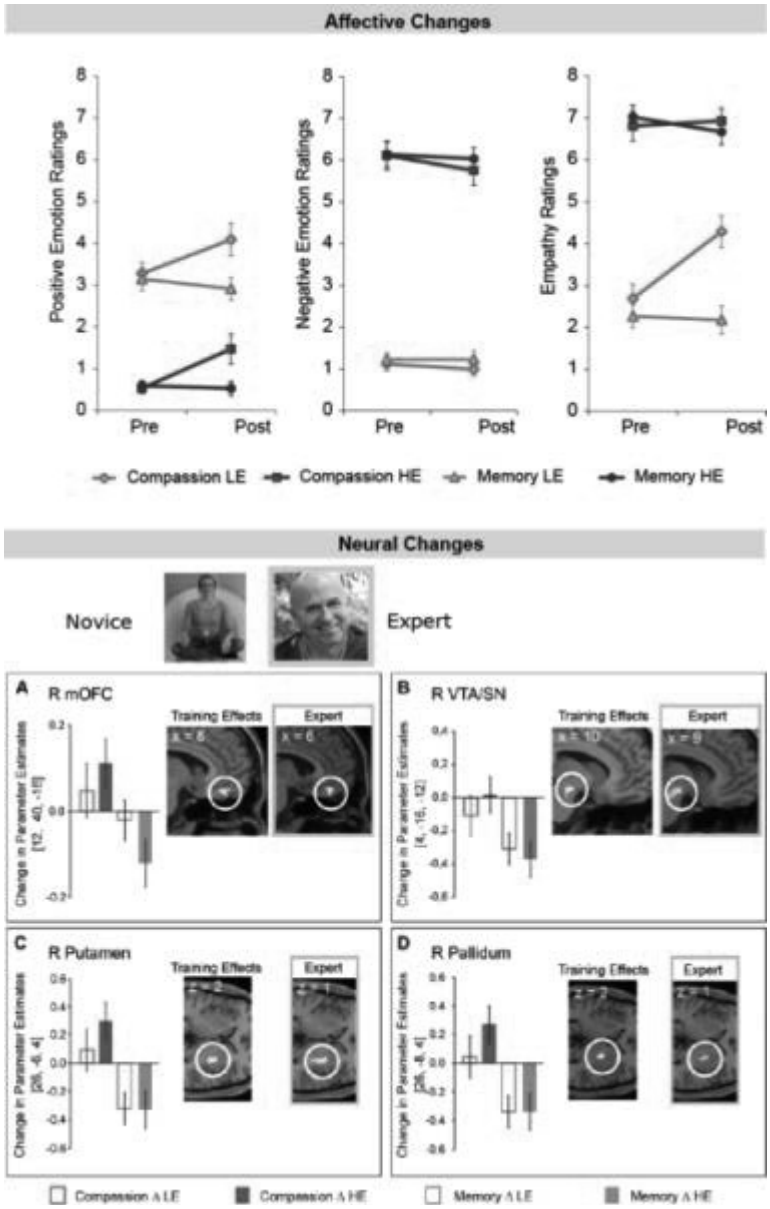


**Figure 5.** Effects of compassion training. **(Upper Panel)** Self-report changes related to compassion training (red) and memory training (blue). Compassion training, but not memory training, increased self-reported positive affect in response to videos showing people in distress (high emotion, HE) and to videos showing people in everyday life situations (low emotion, LE). No changes were observed for negative affect ratings. Compassion training also increased empathy ratings for LE videos. **(Lower Panel)** Neural activation changes in response to others suffering (HE videos) induced through compassion training occurred in (A) the right medial orbitofrontal cortex, mOFC, (B) the right ventral tegmental area/substantia nigra, VTA/SN, (C) the right pallidum and (D) the right putamen. Bar charts show the change in parameter estimates for the training groups in the depicted independent region of interest; error bars denote the standard errors of the mean. Orange boxes show neural activations of an expert practitioner immersed in three compassionate states to a high as compared to a low degree. (Klimecki et al., 2012, with permission)

These findings suggest that the cultivation of compassion engages a neural network that is distinct from activations found in previous empathy studies focusing on sharing the pain of others. In order to investigate whether empathy and compassion can be distinguished on a neural level, we conducted a short-term intervention study in which the same group of participants was first trained in empathy and, only after a subsequent test, received compassion training[13]. In order to control for unspecific training effects, the changes in this group were compared with the memory control group. On the level of self-reports, training empathic resonance increased negative affect and empathy. Remarkably, negative affect was increased in response to both people in distress and even to people in everyday life situations. In other words, empathy training increased the propensity to react to normal everyday situations with negative affect. On the neural level, empathy training increased activations in AI and aMCC – as described above, regions which have repeatedly been involved when meditation-naïve participants empathized with the suffering of others. This suggests that the sensitization to suffering observed on the level of self-reports was paralleled in the brain. Together, these findings underline the belief that engaging in empathic resonance is a highly aversive experience and, as such, can be a risk factor for burnout. Fortunately, the subsequent compassion training could reverse these effects by decreasing negative affect back to baseline and – like in the first study – by strengthening positive emotions. It is notable that compassion again induced this combination of strong positive affect along with normal levels of negative affect. This emphasizes that compassion does not lead to the denial of suffering but enables people to experience positive emotions, in spite of another person's difficulty. On the neural level, compassion induced entirely different activations than did empathy. These activations occurred in medial orbitofrontal cortex, ventral striatum and pregenual anterior cingulate cortex, which together form a network related to positive emotions[18], affiliation and love[19], [20], [21] and reward[22].

In summary, bridging first- and third-person perspective in research with an expert meditator and novice meditators helped to dissociate empathy and compassion as two distinct social emotions and motivations. During the initial investigation of empathy in an expert meditator, Matthieu Ricard's self-reports and the comparison of his brain activation with previous findings in non-meditation experts yielded crucial insights. These findings led to the formulation of a model that conceptualized empathy and compassion as two very distinct inner states with potentially very different consequences for subjective well-being and health. Pursuing this line of research in a training study with novice meditators helped to put this intuition on solid scientific ground. Here, quantitative and qualitative first-person self-reports elucidated how feeling states changed through training empathy or compassion. These self-reports also shed light on the relationship between emotions and observed neural activations. We thus saw that empathy was accompanied by negative affect and stronger activations in neural areas involved in negative affect and empathy for pain. Generally, compassion training strengthened positive affect, prosocial behavior and neural activity related to affiliation, love, and positive emotions. It therefore seems that while empathic resonance may lead to empathic distress, compassion offers a trainable strategy for increasing prosociality and overcoming adverse experiences by strengthening resilience.

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