SIMON PRADES

Empathy is a healthy emotion – but could there be too much of a good thing, asks Emma Young

I feel your pain

TANIA SINGER wasn't the first person to put a Buddhist monk in an fMRI machine. But the neuroscientists who had scanned supposedly caring, sharing brains before did it to find out where empathy comes from. Singer was looking for ways to avoid it.

Few people would argue that the world is cursed with an excess of empathy. But we are starting to discover that our capacity to share other's emotions and take their perspective comes with a sting in its tail. Overdosing on the misfortunes of others is not just a problem for those in high-exposure professions such as nursing. All of us are vulnerable to catching the pain of others, making us angrier, unhappier, and possibly even sicker.

Fortunately, work on locating the root of empathy in the brain has also led to the discovery that with the right training, we might be able to tune how much we let others' emotions affect us. This could allow us the best of both worlds – to care, without letting it consume us.

Empathy is undeniably a good thing. Understanding how others are feeling is a bonding mechanism that we are finding in an increasing number of animals, including dolphins and rats. In humans, primatologist Frans de Waal of Emory University in Atlanta, Georgia, has suggested that being affected by another's emotional state was the earliest step in our evolution as a collaborative species.

But the pitfalls will be apparent to anyone who has been in a room full of babies. If one starts crying, pretty soon, they're all at it. Babies don't understand the difference between their own emotions and those being felt by others, and so what one feels, they all feel. Negative and positive emotions alike spread like a virus. As our sense of self develops, we learn to distinguish other people's emotions from our own, although a variety of experiments, most recently studying our behaviour in online social networks, indicate we are not entirely free of the risk of emotional contagion (see "Socially contagious", below).

That's because the distinction between what we and others feel isn't terribly clear to our brains. Singer, then at University College London (UCL), and her colleagues demonstrated this in 2004 when they put 16 romantic couples into an MRI scanner. When they gave the volunteers a painful electrical shock, this elicited activity in brain regions known to respond to physical pain and also in regions tuned to emotional pain. But when volunteers saw their loved one get a shock, no activity registered in their physical pain centres – while the emotion regions lit up like fireworks. Notable among these was the anterior insula, where a lot of the coordination between brain and body takes place.

Since then, many other studies have confirmed that this "empathy for pain" network exists, and that it doesn't distinguish whether the pain you're observing is physical or psychological. "The basic principle is the same," says Singer, who is now at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig, Germany.

What's more, over the past few years it has become apparent that we don't just catch pain from those we are intimate with. The first hints came from people in care-giving professions who often see the stress and pain of others, such as hospice staff, nurses, psychotherapists and paediatricians. Since the early 1990s, a kind of empathy burnout has increasingly been documented – given names including "secondary traumatic stress" and "vicarious traumatisation". Symptoms include lowered ability to feel empathy and sympathy, increased anger and anxiety, and more absenteeism (see "The hurt locker", page 34). Various studies link these symptoms with an indifferent attitude to patients, depersonalisation and poorer care.

It's perhaps unsurprising that empathy burnout can affect people frequently ›

SOCIALLY CONTAGIOUS

Social networks such as Facebook and Twitter provide for many of us a very public window on our emotions – and seem to indicate just how sensitive those emotions are to outside influence.

In 2014 Facebook caused a furore when the company revealed it had secretly been experimenting with the feelings of half a million users. By tweaking the algorithms that determine whether the stories people see are more positive or negative in tenor, the researchers claimed they had shown that emotional states could be transferred via social network.

In September 2015, researchers at the University of Southern California followed up with their own study on Twitter, demonstrating increases in negative posts after people saw a Twitter timeline that had been tweaked to be more negative than usual.

STRANGER DANGER

How much do you have to care about someone to be infected by their stress? For some of us, not very much.

That at least is the conclusion of Tania Singer at the Max Planck Institute for Human Cognitive and Brain Studies in Leipzig, Germany. She paired volunteers either with a loved one or a stranger and subjected one member of each pair to the Trier social stress test, a standard protocol to induce stress. In front of a panel of judges, you get 3 minutes to prepare a 5-minute speech, and once that's done, you are quizzed for 5 minutes on increasingly difficult arithmetic. All the while, the judges watch impassively. For most people, the test results in a flood of the stress hormone cortisol, clammy hands and a rapid heartbeat.

In Singer's experiment as one member of each pair was tested, their partner merely watched, either through a one-way mirror, or via a television. To remove any fear that the observer would be tested next, they had written guarantees that they wouldn't go through it themselves.

Even so, some 10 per cent of volunteers experienced cortisol flooding simply from watching the stranger's stress – even when that stress was merely on a screen. "To find such a significant hormonal response in someone who is merely passively observing another person getting stressed on TV, even when it was a stranger, was quite a surprise," says Singer.

"Empathy, once a benefit, may become a liability in an anonymous, crowded modern world"

surrounded by other people's pain. But a recent spate of experiments suggests that the dark side of empathy spells trouble for everyone. You can "catch" stress any time you understand someone else's pain and share in it, activating your empathy for pain network.

Empathy overload

One location this is likely to happen is the workplace: we spend 8 or 9 hours a day with our colleagues, creating relationships that help us empathise with and catch their distress. Recently some companies, such as Ochsner Health System, which owns and operates hospitals and clinics in Louisiana, have begun to institute stress-free zones to limit contagion. "Venting is not productive," says Missy Hopson Sparks, a vice-president at Ochsner. So the company designated zones, including hospital floors, where sharp conversations, even whispered, were off limits. Morale in clinics rose. The policy is now company-wide.

Singer's research indicates that for some people the physical effects of emotional contagion apply even when they observe a person they don't know suffering distress (see "Stranger danger", left). That is backed up by experiments in which, for example, people who watched a 15-minute TV newscast reported increased anxiety afterwards, with their anxiety only decreasing after an extended relaxation exercise.

For those less prone to experiencing "empathic distress", it might be tempting to dismiss it as someone else's problem. That's shortsighted, says Olga Klimecki at the University of Geneva in Switzerland. People who experience more empathic distress in their daily lives are more likely to become aggressive when provoked, "even towards an innocent person", she says.

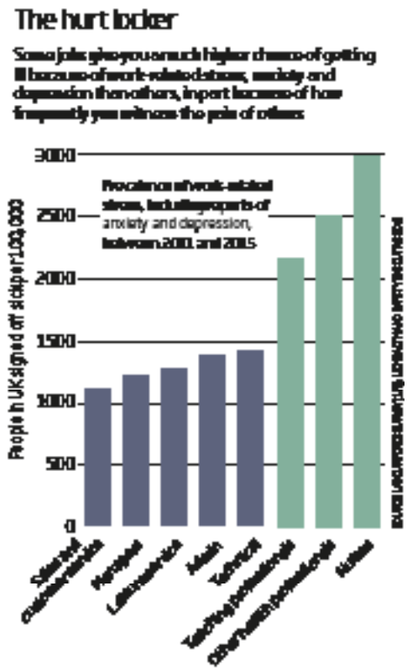
That's backed up by work published by Michael Poulin at the State University of New York at Buffalo published research last year, indicating that empathy can lead us to act aggressively, specifically when we see someone we value being mistreated. "Experiencing a suffering person's distress as if it were your own is highly aversive and unpleasant," he says.

The irony is that the effects of empathy overload might undercut the very things for which empathy evolved in us – mutually beneficial cooperation and collaboration. "Even in the short-term distress transmitted via empathy leads just as much to a desire to escape a helping situation as it does to a desire to help," says Poulin. Empathy, so beneficial when we lived as hunter-gatherers, can be a liability in a modern world characterised by anonymous, crowded cities and emotion-laden media content.

If that's true, can we do anything about it? Perhaps, says Christian Keysers of the Netherlands Institute for Neuroscience in Amsterdam. "Just like some people are better at regulating their own emotions, some are better at regulating empathy," he says. His work suggests we're not stuck with the amount of empathy we are born with, but can adopt the strategies of others.

In 2014, Keysers and his colleagues looked at how people diagnosed with psychopathy, who are commonly thought to lack all capacity for empathy, react when they see images of people in pain. At first, the team presented images without any instructions as to what to feel. The volunteers' brains showed, predictably, less activity in areas associated with empathy for sensations, and in the insula, than the brains of healthy people.

But then Keysers asked his psychopathic volunteers to consciously empathise, and something very different happened: their brain responses were identical to the control group's (*Trends in Cognitive Science*, vol 18, p 163). In other words, even if your default empathy state is "off", you can turn it on when desired. That was an eye-opener, says Keysers: it seemed clear that a spectrum of empathy could exist in all individuals.




ASHLEY GILBERTSON / VII

Hence why Tania Singer found herself putting Matthieu Ricard, a molecular biologist turned Buddhist monk, into an fMRI machine. Experiments have shown that the training Buddhists monks undergo give them a heightened ability to manipulate their neural circuitry of empathy. One of the first such studies was done by Richard Davidson at the University of Wisconsin, Madison. Monk volunteers were asked to lie in fMRI machines as they heard sounds such as women screaming in pain. As they listened, Davidson asked them to engage in a form of compassion meditation known as loving kindness meditation, in which you are encouraged to gradually extend warmth and care out from yourself to others. Davidson found that this process changed the firing of the monks' neural circuitry. It suppressed activity in the anterior insula, the brain region implicated in Singer's earlier experiments on empathy, and also in the amygdala, a region involved in threat detection but recruited during empathic responses.

In her latest experiments with Ricard, Singer asked him to empathise with suffering instead of engaging in compassion as he had been trained to do. When she did so, his empathy for pain network lit up, and almost immediately, he begged her to stop the experiment, calling the feeling "unbearable".

Your inner psycho

This hints that looking on other people with compassion rather than empathy might be a way to sharpen the distinction between you and someone else and avoid empathy burnout. "Compassion is feeling for and not with the other," says Ricard. With Klimecki and others, Singer has started to test the idea on regular people. After putting subjects through compassion training, their brains responded to negative videos much like the monks' brains (*Social Cognitive and Affective Neuroscience*, vol 9, p 873). This was reflected in increased well-being.

Singer's work in this area is fascinating, says Antonia Hamilton at the Institute of Cognitive Neuroscience at UCL, "especially

Stress can be contagious even if we feel it remotely

the distinction between compassion and empathy". Recently, Singer and her team completed the first major project that turned this research into practice. Her group recruited 300 people, some whose jobs put them at higher risk of empathy burnout, and trained them in alternatives to empathy, including compassion.

One participant was Irina Schroen, a nurse in the neonatal unit at the Charité University Clinic in Berlin, Germany, whose experiences had come to affect her so severely that she was ready to give up her career. Singer's training, she says, saved her professional life. "My colleagues are once again happy to work with me," she says. "They say, 'It's incredible how relaxed you are now'."

The results will not be published until later this year, but they were impressive enough that Singer is now setting up a centre to deliver this kind of training to anyone, and 60 people are already signed up. She hopes it will pull more people like Schroen back from the brink of burnout, and more broadly help people and communities deal with social conflict – including problems resulting from war and the arrival of refugees.

Others in high-stress, high-performance professions might benefit from sliding more towards the "psychopath" end of the scale, says Del Paulhus, who studies personality traits at the University of British Columbia in Canada. "Too much empathy would undermine success as a surgeon, an athlete in violent sports, a lawyer, soldier," he says.

It's a point worth bearing in mind now that empathy is firmly on the political agenda. US president Barack Obama has identified an "empathy deficit" as a pressing problem. How to increase it is a hot topic; a recent study by Stanford University researchers appeared to link empathy training for teachers with fewer disciplinary problems in students. Education researchers and business leaders in the US and the UK have called for empathy to be taught in schools.

Appropriately dosed, empathy is undoubtedly a good thing, but we need to consider the side effects before we start prescribing it wholesale. "It's not at all clear the world needs more empathy if that means experiencing another person's suffering as your own," says Poulin. "Doing that may simply double the world's suffering". n

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