

4 Psychological Pain: Metaphor or Reality?

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In the opening chapters of *Anna Karenina*, Dolly discovers that her husband Stiva has cheated on her again. She is furious yet also heartbroken. Tolstoy writes that Dolly ‘winces as if from physical pain’. He repeats this several times for emphasis: ‘Dolly again feels pain and wishes she could inflict even a tiny bit of the same physical pain on him’; ‘She cried out, not looking at him, as if the cry had been caused by physical pain.’¹

While Tolstoy’s characterisation here illustrates his profound insight into human nature, it also points to a confusion about pain that persists today. The fact that Tolstoy uses the simile form and finds it necessary to qualify the pain as ‘physical’ suggests that he may not be so sure about what his character is experiencing. Is it really the *same* feeling one has after breaking a leg or suffering a burn even though nothing has happened to Dolly’s body? Or merely *like* that feeling in some respect or another?

The question raised by Tolstoy’s novel is the subject of this chapter. Can betrayal or rejection lead to pain in the sense that we understand physical pain? How about the death of a loved one? Or a person in the grip of a severe depression? Ultimately, I ask whether these affective states – construed as injuries to the mind – can trigger the same kind of pain as injuries to the body.

Background

Historically, scientists and physicians would have answered this question with a resolute no. Since the time of Descartes, pain (in the West) has been understood as a strictly physical phenomenon.² It occurs when receptors on nerve cells in the skin and internal organs detect damaging stimuli to the body, a pin-prick, for example, or high temperatures. The nociceptors (from the Latin *nocere*, to injure) signal the brain, which responds, in turn, with a series of protective measures. We pull the arm away from the flame and rest the broken leg. This highly effective biological warning system is critical to survival.

The absolute connection between pain and physical injury, however, was called into question during the second half of the twentieth century. Researchers observed occasions when there was devastating injury (wounded soldiers on the battlefield) and yet little or no pain and, conversely, occasions when minor injury produced excruciating pain (migraine).³ In addition, a variety of psychological factors – emotions, expectations, attitudes and memories – were shown to be capable of significantly modifying pain experience.⁴ These findings would eventually be explained by the paradigm-shifting gate control theory of pain introduced by Melzack and Wall in 1965.⁵ Thereafter, the simple stimulus-response model of pain was replaced by a more complex perceptual system whereby nociceptive signals could be influenced at multiple points along their pathways to and from the brain.

In order to accommodate this more nuanced understanding of pain, a new definition was needed. Psychiatrist Harold Merskey proposed the following: ‘Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage.’⁶ The formulation was subsequently taken up by the International Association for the Study of Pain (IASP) and is the most widely circulated definition today. But

while Merskey adds an emotional or affective component to pain and dilutes its connection to physical injury by adding the notion of 'potential damage', he still does not satisfactorily address the problem of psychological pain. In the case of betrayal, grief or depression, there is no tissue damage (either actual or potential), nor is it a matter of an emotional state influencing how tissue damage is experienced. The point is that pain in these instances is caused *solely* by psychological damage. But since the IASP definition and the prevailing scientific models do not allow for such a sequence of events – pain remains bound to physical injury and nociceptor pathways – psychological 'pain' remains outside the scope of pain proper. In fact, most contemporary scientists and physicians would argue that it belongs to a different category altogether, which should more appropriately be labelled suffering or anguish.⁷ Hence, there is no mention of grief or depression in medical classification schemes of pain.

Even psychiatrists are wary of speaking about psychological pain in their domain. Pain of the physical variety can accompany, exacerbate and in some instances cause psychiatric illness.⁸ But the reverse – a psychiatric illness, for example, directly causing physical-like pain that is unrelated to physical injury – is not commonly accepted, except perhaps in the relatively rare case of psychogenic pain, the modern-day equivalent of what Freud once termed hysteria or conversion reaction.⁹ The bottom line is that psychological pain is an oxymoron and is at best a metaphor.

The problem with this view is that it does not square with the way most laypeople feel and express their feelings, and have been doing so at least since Tolstoy's day. Psychological or emotional injury that occurs in the setting of betrayal, grief and depression are routinely described as painful. Moreover, such subjective feelings and their expression are the gold standard by which pain is evaluated and measured. Despite advances in neurobiology, there is no definitive,

objective way to assess pain. Even if a relatively sensitive and specific neurological signature of pain in the brain has been discovered, as a recent *New England Journal of Medicine* report suggests,¹⁰ it will never be the equivalent of (or replace) what is essentially a subjective experience.¹¹

So when Dolly and others say they feel pain, how can we ignore them? Either we agree with the scientist/physician that they are mistaken and what they are feeling is not pain but something categorically distinct, or we must acknowledge pain's presence and change, once again, what we mean by the word and concept of pain.

Like Tolstoy, I believe that pain can indeed occur outside the setting of physical injury and that we must therefore further broaden our definition to accommodate these instances. Two threads of evidence are presented in support of this view: linguistic and neuroscientific.

Linguistic evidence

As mentioned earlier, most people use the word 'pain' when they break a leg and when they lose a spouse – that is, they use the same label for the feeling that accompanies both physical and psychological injury. In addition, they talk of hurt, ache and suffering in both cases.¹² This practice is not exclusive to English speakers and can be observed across a wide variety of languages and cultures, from Hungarian to Inuktitut.¹³ There is also a tendency amongst sufferers to compare these qualitatively interchangeable states more quantitatively, with psychological pain typically winning out in terms of intensity. Of the 30 depressed patients in one study, all of whom also had a history of a life-threatening physical illness, 28 considered their psychological pain worse than any physical pain they experienced.¹⁴

More importantly, when asked to be more descriptive, to try and communicate how such experiences feel, psychological and physical

pain sufferers will do so in similar ways. Pain of any kind is notoriously difficult to express. There are problems conceptualising the experience because it is perceptually inaccessible (we cannot see or touch pain) and because, unlike other subjective states, it is not always linked to external objects that we can see (for example, the person who makes us angry or the pit-bull that frightens us).¹⁵ As a result, we are forced to think of pain indirectly, through metaphor: we imagine a more knowable object connected to the pain and then speak of the experience in terms of that object. We speak of the private and invisible in terms of the public and more accessible.¹⁶

By far the most common metaphor used to describe pain is the weapon.¹⁷ We say a pain is shooting or stabbing. Lengthy lists of similar adjectives can be found on the McGill Pain Questionnaire, which was created in the 1970s by Ronald Melzack and Gil Torgerson to help patients communicate their pain to doctors: piercing, drilling, burning, grinding, throbbing, stinging, squeezing and so on. Each of the descriptors implies the presence of a weapon or weapon-like object that can injure the body – the drill that *drills*, the fire that *burns*. And since most patients have never been stabbed or shot, they are using these terms figuratively to objectify their experiences; now they can *see* pain and describe how they feel by talking about knives and guns, and the damage they can do to the body.

It turns out that people with psychological pain use the very same metaphors to describe their experiences.¹⁸ Wracked with grief by the loss of her husband, Joan Didion envisions giant waves. In her memoir, *The Year of Magical Thinking*, she writes that she felt as if she were being battered by ‘destructive waves, paroxysms, sudden apprehensions that weaken the knees and blind the eyes and obliterate the dailiness of life’.¹⁹ Waves in their temporal and physical dimensions are weapon-like objects that move toward and strike the body. In his classic paper on grief, psychiatrist Eric Lindemann found that the majority of bereaved subjects he studied routinely

experienced such destructive waves.²⁰

The Mexican painter Frida Kahlo often felt like Tolstoy's Dolly. In *Memory* (1937), she depicts her pain from the repeated infidelities of her husband Diego Rivera as a sword that pierces her vest and penetrates the left side of her chest. In the painting's foreground lies the proverbial broken heart, greatly enlarged, detached from its normal place in the body and spurting blood from every ventricle. Tears stream down Frida's cheeks while a threatening sky looms overhead.

Novelist William Styron suffered from depression and wrote about it in his memoir *Darkness Visible*. When the pain was at its worst, Styron felt like he was being 'suffocated' and 'drowned', like a 'howling tempest was battering his brain'.²¹ Kay Redfield Jamison, a psychiatrist also battling depression, imagines a more elaborate weapon for her pain: a giant centrifuge, containing tubes of blood, that spins around her mind faster and faster, until it explodes and splatters blood everywhere.²²

Listening to the language of pain of all varieties – in the clinic as well as in the arts and literature – we discover a shared felt structure that the weapon metaphor effectively captures. Whether triggered by grief and depression or kidney stones and spinal injury, pain reads like a narrative in three parts:

Weapon → Injury → Withdrawal

In pain we feel as if there must be some weapon-like object (wave, sword, centrifuge) that moves toward and threatens us; that when it strikes, it will cause injury; and from which we must turn away. Even when there is nothing moving against us, when there is no injury, when we remain stationary, we *feel* the movement, the injury and the desire to run.²³ And because those same feelings are present in both psychological and physical injury, people naturally label the experience with the same word and describe it using the same

metaphors.²⁴

Evidence in the brain

There is also new evidence for broadening our notion of pain to include instances of psychological injury. As previously mentioned, the introduction of gate control theory progressively weakened the link between tissue damage and pain so that we can no longer understand pain in terms of the body alone. We are now very much aware that a host of extra-corporeal factors – one's culture and past experiences, our emotional and cognitive states, the context of pain – can intensify or dampen a nociceptor signal before and after it registers in higher brain centres.²⁵ Moreover, many cases of chronic pain seem to occur without any direct nociceptor stimulation at all. Neuropathic pain, for example, results when a dysfunctional nervous system fires spontaneously or misinterprets harmless sensory stimuli as noxious.²⁶ In some cases, neuropathic pain follows on the heels of a specific physical injury, while in others, no preceding injury can be identified. In trigeminal neuralgia or *tic douloureux*, the movement of a feather across the face can trigger spasms of intense pain.²⁷

A second strand of evidence comes from our growing understanding of how the brain processes pain. We have learned that pain is a highly complex perceptual system with multiple subsystems. Most important for this discussion are the distinct areas in the brain that process the sensation of pain (its quality, location and intensity) and our feelings about the sensation (the narrative of its aversiveness).²⁸ Typically, the *sensory* centre (in the somatosensory cortex) and the *affective* centre (in the anterior cingulate and insula cortices) are linked and activated simultaneously: tea spills on the arm, generates a burning sensation that is felt to be damaging and initiates a series of protective responses.

However, in certain instances, these centres can be unlinked. For example, a person can have the sensation of pain but not feel pain.²⁹

This is observed in patients undergoing minor surgery with medication that makes them indifferent to an incision made with a scalpel. Even more dramatic is a rare group of patients with *pain asymbolia*, whose affective pain centres (or the connections to those centres) have been destroyed. These patients can sense a needle prick (because the nociceptor signal registers in the somatosensory cortex) but will laugh at its insignificance (because the signal is not processed by the anterior cingulate cortex).³⁰ Such cases hardly resemble what we think of as pain because without the *feeling* of pain, protective measures will not be taken and the experience loses its biological significance. In other words, without the affective component, pain becomes meaningless.

What about the reverse, namely having the feeling of pain without specific sensations of pain generated via nociceptor pathways? There is now evidence that affective pain centres in the brain can be directly activated by psychological injury. Naomi Eisenberger and her colleagues at UCLA have recently developed a clever model of what they call social pain, namely the painful feelings that follow social rejection or loss.³¹ Subjects were asked to play a video ball-tossing game while their brains were monitored by fMRI. At a certain point, the subjects were excluded from the virtual game and reported experiencing distress that correlated with increased blood flow to the anterior cingulate and insular cortices.³² This is exactly the same pattern that would have occurred had they been pricked by a needle (except for the absence of somatosensory cortical blood flow, which was expected since there was no tissue damage). The greater the social pain generated, the more active the affective pain centres became. Similar studies were carried out on grieving subjects and they showed the same results.³³ In grief as well as rejection, people *feel pain* which is reflected in their brain scans and in the words they use. Thus, the most meaningful component of pain appears to be fully operative in the absence of physical injury.³⁴

Pain as feeling

Clearly the most critical aspect of pain from a biological point of view is its affective component, the aversive feeling of injury or impending injury. In fact I would argue that when tissue damage is present but not felt as pain (wounded soldiers, anaesthesia, *pain asymbolia*), we should not label the experience as 'pain' at all. On the other hand, when pain is felt in the absence of tissue damage (in the cases of Tolstoy's Dolly, Frida Kahlo, Joan Didion and Kay Redfield Jamison given above), the pain is very real indeed and serves the same biological signal as physical pain, motivating sufferers to take protective measures.

Pain is fundamentally an alarm system that has evolved to protect us from injury. In earlier times the threats were primarily physical. Primitive pain pathways are found in single-celled creatures like the paramecium so that it could avoid noxious physical stimuli.³⁵ At some point in evolution, however, when consciousness and self-awareness developed, the nature of potential threats would have naturally expanded to include noxious psychological stimuli, and physical pain pathways might have been used to regulate those threats. This is precisely what seems to have happened in the case of separation distress. In his studies on a wide variety of non-human mammals (dogs, guinea pigs, chicks, rats and primates) separated from their mothers during infancy, Jaak Panskepp found that physical pain mediators like morphine and other opioids were able to alleviate this patently non-physical pain (as measured by the isolation cries of the animals).³⁶

Clearly social bonds had become critical to mammalian well-being and survival, requiring mechanisms to recognise and react to the threat of exclusion.³⁷ The same is likely true for all aspects of a human being's psychological integrity. Because our conscious, inner lives are now as important to our well-being as our bodies, we must have ways to protect ourselves from psychological injury. Researchers including

Panskepp and Eisenberger have proposed that over the course of evolution, psychological pain has 'piggybacked' onto the pre-existing physical pain alarm system, borrowing its signals and mediators to preserve our psychological health.³⁸

I would also argue that this borrowing between the two pain systems (as well as the progressive integration of the mental and physical spheres in general) has led to a progressive blending and blurring of pain experience, whereby it has become increasingly difficult to determine what kind(s) of injury produces our pain. We are very far from the single-celled creature that responds to threatening stimuli in a reflexive, unfeeling way. In fact, at this point there may be no such thing as an isolated physical pain, just as there may be no such thing as an isolated psychological pain. Pain is always a composite. Cancer patients naturally have pain from primary and metastatic tumours, but they also experience the psychological pain of overwhelming fear and threat.³⁹ Likewise, Joan Didion and other grieving subjects typically complain of physical symptoms that can include difficulty breathing, fatigue and tightness in the throat.⁴⁰

An interesting study on social pain illustrates this blending of the physical and psychological and its neural correlates. Researchers asked subjects to relive an experience of rejection while they were shown pictures of a boyfriend or girlfriend who recently broke up with them. Their intention was to generate a more intense pain than Eisenberger's Cyberball model. As expected, fMRI scanning revealed activation of the affective pain centres in the brain. However, there was also activation of somatosensory centres (even though nociceptors were presumably silent).⁴¹ These findings begin to show how psychological injury might lead to the physical symptoms reported by so many psychological pain sufferers. The bottom line is that pain – its causes and its felt manifestations – will always involve both the body and the mind.⁴²

Consequences of a broader approach

The time is ripe for broadening our definition of pain, recognising it as the feeling of injury to a *person* rather than a *body*. Such a reformulation will gradually lead to changes in the way we understand and manage pain. First, it will reduce the semantic confusion involved in pain language so that we will not constantly need to qualify and pigeonhole pain (as Tolstoy did in *Anna Karenina* and as I have done throughout this chapter) as either physical or psychological (or even social), but regard it instead as a composite. Whenever the aversive feeling of injury or the threat of impending injury is experienced by a person, there will inevitably be pain.

Second, a broader understanding of pain would equalise the different types of pain, which is not only intellectually important but morally so. The traditional, dualistic paradigm privileges physical pain: if there is no tissue damage or lesion on fMRI, then there is no 'real' pain. But how then should we respond to Frida Kahlo, Joan Didion and countless less well-known sufferers who insist that the pain they feel is real and in many cases is a lot worse than any physical pain they have experienced. Indeed, suicide rates are significantly higher in the setting of grief and depression than they are in the setting of physical pain.⁴³

In addition to relegating psychological pain to second-class status, the traditional paradigm is also harmful to another large (and growing) group of sufferers.⁴⁴ Patients with chronic pain from migraine, lower back conditions and fibromyalgia find themselves in limbo between 'real' pain and the derivative variety. On the one hand, their pain seems physical (because it is localisable to the body), but, on the other hand, it has more in common with the psychological kind (because there is no detectable tissue damage). Not surprisingly, medicine has been ineffective at managing such patients. Worse, their pain is often not believed. Although things have improved for chronic pain patients with the advent of pain specialists and pain clinics,

many are still tormented by the insidious logic of the prevailing biomedical approach.⁴⁵

Finally, a change in mindset would encourage new approaches in treating pain. One might, for example, offer ‘physical pain’ medication for ‘social pain’, as DeWall and associates did when they administered acetaminophen (paracetamol) to subjects and found that it reduced their daily complaints of distress (along with anterior cingulate cortical activity in response to exclusion from the video ball-tossing game).⁴⁶ By the same token, ‘psychological pain’ therapies might be administered to treat cancer and chronic pain since we know from placebo studies that belief and expectation are effective analgesics.⁴⁷ Similar levels of pain relief have occurred by bolstering a patient’s social support and inducing pleasurable feelings. A recent study, for example, found that showing a subject a picture of a romantic partner was able significantly to reduce the intensity of a painful stimulus.⁴⁸

Towards a new definition

Ultimately, we must move away from the old definition of pain (with its emphasis on tissue damage) and find a new and more useful one. As a starting point, I propose the following: ‘Pain is the aversive feeling of injury to one’s person and the threat of further, potentially more serious injury. It can only be described metaphorically.’ This definition includes five critical elements:

1. Pain is a *feeling*, in neurologist Antonio Damasio’s sense of the term. Damasio defines feeling as a higher-order, conscious appraisal of an organism’s state at a given time, an appraisal that prompts self-regulating behaviour aimed at ensuring well-being.⁴⁹
2. The feeling of pain signals an *injury* occurring at the level of the *person*, be it bodily or psychological damage or, more commonly, a composite of the two.
3. The feeling of pain prompts self-regulating behaviour. Pain’s

inherent *aversiveness* (from the Latin *avertere*, to turn away from) urges us to withdraw the arm from the flame and whatever else we can do to alleviate it.⁵⁰

4. The feeling of pain involves the present as well as the future. Pain signals the presence of injury as well as the *threat* of further, potentially more serious injury.⁵¹
5. Because of the difficulties involved in conceptualising and representing pain, the feeling of pain can only be described *metaphorically*.

Notes

1. L. Tolstoy, *Anna Karenina* (trans. Richard Pevear and Larissa Volokhonsky) (London: Penguin, 2000), 3, 11.
2. In Vernon Mountcastle's popular textbook, for example, the definition of pain as 'a sensory experience evoked by stimuli that injure or threaten to destroy tissue' (*Medical Physiology* (St Louis: C.V. Mosby, 1980), 391) is essentially a restatement of Descartes' simple stimulus-response model (a flame activates skin particles ... pulls on a cord ... sets off a bell in the brain ... produces pain).
3. R. Melzack and P.D. Wall, *The Challenge of Pain* (London: Penguin, 1996), 3–14.
4. *Ibid.*, 15–33.
5. R. Melzack and P.D. Wall, 'Pain Mechanisms: A New Theory', *Science*, 150 (1965): 971–9.
6. H. Merskey, 'Psychological Aspects of Pain', *Postgraduate Medical Journal*, 44 (1968): 297–306; IASP Subcommittee on Taxonomy, 'Pain Terms: A List with Definitions and Notes on Usage', *Pain*, 3 (1979): 249–52.
7. E. Cassell, *The Nature of Suffering and the Goals of Medicine* (New York: Oxford University Press, 1991), 30–46.

8. M.J. Bair, R.L. Robinson, W. Katon and K. Kroenke, 'Depression and Pain Comorbidity: A Literature Review', *Archives of Internal Medicine*, 163 (2003): 2433–45.
9. The category of psychogenic pain in DSM-III (1987) has since been replaced by the broader category of 'pain disorder' in DSM-IV (2000) and DSM-V (2013), but these changes still fail to address the pervasiveness of pain experienced and reported by psychiatric patients. See Merskey, 'Psychological Aspects of Pain'.
10. T.D. Wager, L.Y. Atlas, M. Lindquist *et al.*, 'An fMRI-Based Neurologic Signature of Physical Pain', *New England Journal of Medicine*, 368 (2013): 1388–97.
11. The failure of the scientific or materialist programme to account for subjective experience like pain has been the concern of philosopher Thomas Nagel since his seminal article 'What is it Like to Be a Bat' *Philosophical Review*, 83 (1974): 435–50. According to Nagel, any psychophysical reduction, like an fMRI signature of pain in the brain, will inevitably leave out the essential character of a subjective experience, namely that it is experienced (and accessible) from only one point of view.
12. S. Mee, B.G. Bunney, C. Reist *et al.*, 'Psychological Pain: A Review of Evidence', *Journal of Psychiatric Research*, 40 (2006): 680–90.
13. G. MacDonald and M.R. Leary, 'Why Does Social Exclusion Hurt? The Relationship between Social and Physical Pain', *Psychological Bulletin*, 131(2) (2005): 202–23. This includes Tolstoy's Russian where the word *bol'* can refer to both physical and psychological pain.
14. H. Osmand, R. Mullaly and C. Bisbee, 'The Pain of Depression Compared with Physical Pain', *Practitioner*, 228 (1984): 849–53.

15. D.E. Biro, *The Language of Pain: Finding Words, Compassion, and Relief* (New York: Norton, 2000), 36–47.
16. *Ibid.*, 79–96.
17. E. Scarry, *The Body in Pain: The Making and Unmaking of the World* (New York: Oxford University Press, 1985), 15–19.
18. Merskey deserves credit for recognising the metaphorical language of pain and, in particular, its dependence on physical injury, even in the case of psychological pain where sufferers invariably talk ‘in terms of tissue damage’.
19. J. Didion, *The Year of Magical Thinking* (New York: Knopf, 2005), 27–8.
20. E. Lindemann, ‘Symptomatology and Management of Acute Grief’, *American Journal of Psychiatry*, 101 (1944): 141–8.
21. W. Styron, *Darkness Visible* (New York: Vintage, 1992), 17, 38.
22. K.R. Jamison, *An Unquiet Mind: A Memoir of Moods and Madness* (New York: Vintage, 1996), 79–80.
23. Biro, *Language of Pain*, 91–3.
24. While the basic structure of the weapon metaphor has remained relatively constant, it has been adapted and elaborated to fit the needs of people in different times and places. See Joanna Bourke, ‘Pain and the Politics of Sympathy, Historical Reflections, 1760s to 1960s’ (University of Utrecht, 2011), available at: http://dspace.library.uu.nl/bitstream/handle/1874/210217/Bourke_Joanna_oratie.pdf?sequence=1 (date accessed 21 February 2014); and *The Story of Pain: From Prayer to Pain Killers* (Oxford University Press, forthcoming, 2014).
25. Melzack and Wall, *Challenge of Pain*, 15–33; T. Hampton, ‘A World of Pain: Scientists Explore Factors Controlling

- Pain Perception', *Journal of the American Medical Association*, 296(20) (2006): 2425–8.
26. C.J. Woolf and R.J. Mannion, 'Neuropathic Pain: Aetiology, Symptoms, Mechanisms, and Management', *The Lancet*, 353 (1998): 1959–64.
 27. J.M. Zakrzewska, *Insights: Facts and Stories Behind Trigeminal Neuralgia* (Gainesville, FL: Trigeminal Neuralgia Association, 2006).
 28. D.D. Price, 'Psychological and Neural Mechanisms of the Affective Dimension of Pain', *Science*, 288 (2000): 1969–72.
 29. N. Grahek, *Feeling Pain and Being in Pain* (Cambridge, MA: MIT Press, 2007), 29–50.
 30. M. Berthier, S. Statkstein and R. Leiguarda, 'Pain Asymbolia: A Sensory-Limbic Disconnection Syndrome', *Annals of Neurology*, 24 (1988): 41–9.
 31. N.I. Eisenberger and M.D. Lieberman, 'Why Rejection Hurts: The Neurocognitive Overlap between Social Pain and Physical Pain', in K.D. Williams, J.P. Forgas and W. Von Hippel (eds), *The Social Outcast: Ostracism, Social Exclusion, Rejection, and Bullying* (New York: Cambridge University Press, 2005), 109–27.
 32. N.I. Eisenberger, M.D. Lieberman and K.D. Williams, 'Does Rejection Hurt? An fMRI Study of Social Exclusion', *Science*, 302 (2003): 209–92.
 33. H. Gundel, M.F. O'Connor, L. Littrell *et al.*, 'Functional Neuroanatomy of Grief: An fMRI Study', *American Journal of Psychiatry*, 160 (2003): 1946–53; M.F. O'Conner, D.K. Wellisch, A. Stanton *et al.*, 'Craving Love? Enduring Grief Activates Brain's Reward Centers', *NeuroImage*, 42 (2008): 969–72.
 34. Additional evidence of overlapping neural pathways for

- social and physical pain include: 1) studies showing that individuals who are more sensitive to one type of pain are also more sensitive to the other; and 2) studies showing that factors that can modulate one type of pain can also modulate the other. See Naomi Eisenberger, 'The Neural Bases of Social Pain: Evidence for Shared Representations with Physical Pain', *Psychosomatic Medicine*, 74 (2012): 126–35.
35. W.R. Clark and M. Grunstein, *Are We Hardwired?: The Role of Genes in Human Behavior* (New York: Oxford University Press, 2000), 34–7.
 36. J. Panskepp, B.H. Herman, R. Conner *et al.*, 'The Biology of Social Attachments: Opiates Alleviate Separation Distress', *Biological Psychiatry*, 13 (1978): 607–18.
 37. Reviewing data from a number of animal studies, Baumeister and Leary argue that social animals that form strong relationships and are integrated into group living are most likely to survive, reproduce and raise offspring to reproductive age. R.F. Baumeister and M.R. Leary, 'The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation', *Psychological Bulletin*, 117 (1995): 497–529.
 38. N.I. Eisenberger, 'The Pain of Social Disconnection: Examining the Shared Neural Underpinnings of Physical and Social Pain', *Nature Reviews Neuroscience*, 13(6) (2012): 421–34.
 39. N.I. Cherney, N. Coyle and K.P. Foley, 'Suffering in the Advanced Cancer Patient: A Definition and Taxonomy', *Journal of Palliative Medicine*, 10 (1994): 51–70.
 40. Lindemann, 'Symptomatology and Management of Acute Grief'.
 41. E. Kross, M. Berman, W. Mischel *et al.*, 'Social Rejection

Shares Somatosensory Representations with Physical Pain’, *Proceedings of National Academy of Sciences USA*, 108(15) (2011): 6270–75.

42. It should also be said – and indeed will be emphasised throughout this book – that pain also always involves the social context and culture in which a sufferer is situated, especially when that sufferer is engaged in representing and finding meaning for his or her pain. Key works that explore the social dimensions of pain include Arthur Kleinman, *The Illness Narratives: Suffering, Healing, and the Human Condition* (New York: Basic Books, 1988); David Morris, *The Culture of Pain* (Berkeley: University of California Press, 1991) and *Illness and Culture in the Postmodern Age* (Berkeley: University of California Press, 2000); Javier Moscoso, *Pain: A Cultural History* (Basingstoke: Palgrave Macmillan, 2012); and Bourke, *Story of Pain*.
43. E.S. Schneidman, ‘Perspectives on Suicidology: Further Reflections on Suicide and Psychache’, *Suicide and Life-Threatening Behavior*, 28 (1998): 245–50.
44. The prevalence of chronic pain in the general population is estimated at between 10 and 55 per cent. C. Harstall and M. Ospina, ‘How Prevalent is Chronic Pain?’, *Pain Clinical Updates International Association for the Study of Pain*, 11 (2003): 1–4.
45. See Lous Heshusius’ poignant memoir of her life with chronic pain: *Inside Chronic Pain: An Intimate and Critical Account* (New York: Cornell University Press, 2009); and Deborah Padfield’s photographic collaborations with chronic pain patients in *Perceptions of Pain* (Stockport: Dewi Lewis, 2003).
46. N.C. DeWall, G. MacDonald, G. Webster *et al.*, ‘Acetaminophen Reduces Social Pain: Behavioral and

- Neural Evidence', *Psychological Science*, 21(7) (2010): 931–7.
47. F. Benedetti, *Placebo Effects: Understanding the Mechanisms in Health and Disease* (Oxford University Press, 2009), 38–52. See also Moscoso, Chapter 2, this volume.
48. J. Younger, A. Aron, S. Park *et al.*, 'Viewing Pictures of a Romantic Partner Reduces Experimental Pain: Involvement of Neural Reward Systems', *Plos One*, 5(10) (2010): e13309.
49. A. Damasio, *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain* (New York: Harcourt, 2003), 83–133.
50. On first blush, the pain-seeking behaviour of the sadomasochist or religious ascetic might seem to contradict the fundamental aversiveness of pain. However, the goal in these cases is not pain but pleasure, and the only way to achieve that goal – for those who embrace the particular narrative – is *through* pain and all its aversiveness. In a related sense, for many who engage in self-harming behaviour, the motivation is to replace a greater psychological pain with a lesser (and more visible/believable) physical pain.
51. Biro, *Language of Pain*, 99–110. Thomas Szasz, drawing on Freud, was one of the first to think of pain in terms of a threat to the continuity or integrity of the body (for which I would substitute person). See Thomas Szasz, *Pain and Pleasure: A Study of Bodily Feelings* (Syracuse University Press, 1988), 59–62.