Fourteen

Feeling Someone's Pain, Understanding Someone's Pain, Alleviating Someone's Pain

A person is in pain, frightened, or crushed with a malignant sadness. And another human, knowing that, is likely to experience something absolutely remarkable—an aversive state that is approximated by the word "empathy." As we'll see in this chapter, it is a state on a continuum with what occurs in a baby or in another species. The state takes varied forms, with varied underlying biology, reflecting its sensorimotor, emotional, and cognitive building blocks. Various logical influences sharpen or dull the state. All leading to this chapter's two key questions: When does empathy lead us to actually do something helpful? When we do act, whose benefit is it for?

“FOR” VERSUS “AS IF” AND OTHER DISTINCTIONS

Empathy, sympathy, compassion, mimicry, emotional contagion, sensorimotor contagion, perspective taking, concern, pity. Let the terminology and squabbles begin over definitions of ways in which we resonate with someone else’s adversity (along with the question of whether the opposite of such resonance is gloating pleasure or indifference).

We start with, for want of a better word, primitive versions of resonating with someone’s pain. There’s sensorimotor contagion—you see a hand poked with a needle, and the part of your sensory cortex that maps onto your hand activates, sensitizing you to the imagined sensation. Perhaps your motor cortex will also activate, causing you to compress your own hand. Or you watch a tightrope walker and involuntarily put your arms out for balance. Or someone has a coughing fit, and your throat constricts.

Even more explicitly motoric is the act of matching movements with simple mimicry. Or there’s emotional contagion, the automatic transfer of strong emotive states—such as one baby crying because another is, or someone catching the fever of a mob plunging into a riot.

Your resonance with someone’s plight can carry an implicit power differential. You can pity someone in pain—recalling Fiske’s categories of Thems in chapter 11, this belittling pity means you view the person as high in warmth and low in competence and agency. And we all know the everyday meaning of “sympathy” (“Look, I sympathize with your situation, but . . .”); you have the power to alleviate their distress but choose not to.

Then there are terms reflecting how much your resonance is about emotion versus cognition. In that sense “sympathy” means you *feel* sorry for someone else’s pain without understanding it. In contrast, “empathy” contains the cognitive component of understanding the cause of someone’s pain, taking his perspective, walking in his shoes.

And then there are distinctions introduced in chapter 6, describing how much you and your own feelings play into resonating with someone else’s distress. There’s the emotionally distanced sense of sympathy, of feeling *for* someone.

There's the rawer, vicarious state of feeling their pain *as if* it were happening to you. And then there is the more cognitively distanced state of perspective taking, of imagining what this must be like for *her*, not you. As we'll see, an as-if state carries the danger that you experience her pain so intensely that your primary concern becomes alleviating your own distress.

Which raises a different word—"compassion," where your resonance with someone's distress leads you to actually help.[1]

Perhaps most important, these words are generally about inwardly motivated states—you can't force someone to truly feel empathy, can't induce it in them with guilt or a sense of obligation. You can generate ersatz versions of it those ways, but not the real thing. Consistent with that, some recent work shows that when you help someone out of empathy, there is a very different profile of brain activation from when you do so out of an obliged sense of reciprocity.[2]

As usual, we gain insights into the nature and biology of these states by looking at their rudiments in other species, their development in children, and their pathological manifestations.

EMOTIONALLY CONTAGIOUS, COMPASSIONATE ANIMALS

Lots of animals display building blocks of empathic states (I use "empathic state" throughout the chapter when referring to the collectivity of sympathy, empathy, compassion, etc.). There's mimicry, a cornerstone of social learning in many species—think young chimps watching Mom to learn to use tools. Ironically, humans' strong proclivity for imitation can have a downside. In one study chimps and children observed an adult human repeatedly accessing a treat inside a puzzle box; crucially, the person added various extraneous movements. When exploring the box themselves afterward, chimps imitated only the steps needed to open it, whereas kids "overimitated," copying the superfluous gestures as well.*[3]

Social animals are also constantly buffeted with emotional contagion—shared states of arousal in a pack of dogs or male chimps going on a border patrol. These are not terribly precise states, often spilling over into other behaviors. For example, say some baboons flush out something good to eat—say, a young gazelle. The gazelle is running like hell, with these baboons in pursuit. And then the male in front seems to think something along the lines of "Well, here I am running fast and—WHAT? There's my hated rival running right behind me! Why's that jerk chasing me?" He spins around for a head-on collision and fight with the baboon behind him, gazelle forgotten.

Mimicry and emotional contagion are baby steps. Do other animals feel one another's pain? Sort of. Mice can learn a specific fear association vicariously by observing another mouse experiencing the fear conditioning. Moreover, this is a social process—learning is enhanced if the mice are related or have mated.[4]

In another study a mouse would be exposed to an aggressive intruder placed in its cage.[5] As shown previously, this produces persistent adverse consequences—a month later, such mice still had elevated glucocorticoid levels and were more anxious and more vulnerable to a mouse model of depression.* Importantly, the same persistent effects would be induced in a mouse merely observing another mouse experiencing that stressful intruder paradigm.

An even more striking demonstration of "your pain is my pain" in another species came in a 2006 *Science* paper from Jeff Mogil of McGill University.[6] A mouse would observe another mouse (separated from it by Plexiglas) in pain, and, as a result, its own pain sensitivity increased.* In another part of the study, an irritant would be injected in a mouse's paw; mice typically lick their paw at that point, with the amount of licking indicating the amount of discomfort. Thus, X amount of the irritant would produce Z amount of licking. However, if the mouse was simultaneously observing a mouse who had been exposed to more than X amount of irritant and who thus was licking more than Z amount, the subject mouse would lick more than usual. Conversely, if the subject observed a mouse licking less (having been exposed to less than X amount of irritant), it would also lick less. Thus the amount of pain a mouse was feeling was modulated by the amount of pain a nearby mouse was. Importantly, this was a social phenomenon—this shared pain only occurred between mice that were cagemates.*

Obviously we can't know the internal state of these animals. Were they feeling bad for the other mouse in pain, feeling "for" or "as if," taking the other mouse's perspective? Pretty unlikely, making the use of the word "empathy" in this literature controversial.[7]

However, we can observe overt behavior. Do other species proactively lessen the distress of another individual? Yes.

As we will see in the final chapter, numerous species show "reconciliative" behavior, where two individuals, soon after a negative interaction, show higher-than-chance levels of affiliative behaviors (grooming, sitting in contact) between them, and this decreases the odds of subsequent tensions between them. As shown by de Waal and colleagues, chimps also show third-party "consolation" behavior. This is not when, after two individuals fight, some bleeding-heart chimp indiscriminately nices both of them. Instead the consoler is preferentially affiliative to the victim over the initiator of the fight. This reflects both a cognitive component of tracking who started a tension and an affective desire to comfort. Similar consolation, focused on fight victims, also occurs in wolves, dogs, elephants, and corvids (who preen the feathers of victims). Ditto for bonobos—with some bonoboesque sex thrown in for victims along with all that platonic grooming. In contrast, such consolation doesn't occur in monkeys.[8]

Consolation is also shown among those heartwarming pair-bonding prairie voles, as shown in a 2016 *Nature* paper from Larry Young of Emory University, a pioneer of the vole/monogamy/vasopressin story, along with de Waal.[9]

Members of a vole pair would be placed in separate rooms. One of the pair would be either stressed (with a mild shock) or left undisturbed; pairs were then reunited. As compared with unstressed individuals, stressed ones would be licked and groomed more by their partner. Partners would also match the anxiety behaviors and glucocorticoid levels of their stressed pairmate. This didn't occur for a stressed stranger, nor among polygamous meadow voles. As we'll see, the neurobiology of this effect is all about oxytocin and the anterior cingulate cortex.

Animals will intervene even more proactively. In one study rats worked more (pressing a lever) to lower a distressed rat, dangling in the air in a harness, than a suspended block. In another study rats proactively worked to release a cagemate from a stressful restrainer. Subjects were as motivated to do this as to get chocolate (nirvana for rats). Moreover, when a rat could both release the cagemate and get chocolate, they'd share it more than half the time.[10]

This prosociality had an Us/Them component. The authors subsequently showed that rats would work to release even a strange rat—so long as it was of the same strain and thus nearly genetically identical.[11] Is this automatic Us/Them-ing built on the genetics of shared pheromone signatures (back to chapter 10)? No—if a rat is housed with a cagemate of another strain, it will help individuals of that other strain. And if a rat is switched at birth and raised by a female of another strain, it helps members of its adopted but not its biological strain. "Us" is malleable by experience, even among rodents.

Why do all these animals labor away consoling another individual in distress, or even helping them? It's probably not conscious application of the Golden Rule, and it's not necessarily for the social benefits—rats were just as likely to release cagemates from restrainers even if they didn't get to interact afterward. Maybe it's something resembling compassion. On the other hand, maybe it's just self-interest—"That dangling rat's incessant alarm calls are getting on my nerves. I'm going to work to lower him so he'll shut up." Scratch an altruistic rat and a hypocrite bleeds.

EMOTIONALLY CONTAGIOUS, COMPASSIONATE CHILDREN

A recap of material covered in chapters 6 and 7:

As we saw, a developmental landmark is attaining Theory of Mind, something necessary but not sufficient for empathy, which paves the way for increasing abstraction. The capacity for simple sensorimotor contagion matures into empathic states for someone's physical pain and, later, for someone's emotional pain. There's the progression from feeling sorry for an individual (e.g., someone homeless) to feeling sorry for a category (e.g., "homeless people"). There is increasing cognitive sophistication, as kids first distinguish between harming an object and harming a person. Likewise for distinguishing between intentional and unintentional harm, along with a capacity for moral indignation that is more readily evoked by the former. Along with this comes a capacity to express empathy and a sense of responsibility to act upon it, to be proactively compassionate. Perspective taking matures as well, as the child transitions from solely being capable of feeling "for" to also feeling "as if."

As we saw, the neurobiology of this developmental arc makes sense. At the age where an empathic state is evoked only by someone's physical pain, brain activation centers on the periaqueductal gray (PAG), a fairly low-level way station in the brain's pain circuitry. Once emotional pain can evoke an empathic state, the profile is mostly about coupled activation between the (emotional) vmPFC and limbic structures. As the capacity for moral indignation matures, coupling among the vmPFC, the insula, and amygdala emerges. And as perspective taking comes into play, the vmPFC is increasingly coupled to regions associated with Theory of Mind (like the temporoparietal junction).

This was our picture of empathic states in kids being built upon the cognitive foundation of Theory of Mind and perspective taking. But as we also saw, there are empathic states earlier on—infants showing emotional contagion, a toddler trying to comfort a crying adult by offering her stuffie, long before textbook Theory of Mind occurs. And just as with empathic states in other animals, one must ask whether compassion in kids is mostly about ending the sufferer's distress or ending their own.

AFFECT AND/OR COGNITION?

This again. We can predict the major punch lines, thanks to the previous three chapters: both cognitive and affective components contribute to healthy empathic states; it's silly to debate which is more important; what's interesting is seeing when one predominates over the other. Even more interesting is to look at the neurobiology of how those components interact.

The Affective Side of Things

When it comes to empathy, all neurobiological roads pass through the anterior cingulate cortex (ACC). As introduced in chapter 2, this frontal cortical structure has starred in empathy neuroscience ever since people felt someone else's pain while inside a brain scanner.[12]

Given its more traditional roles in mammals, the ACC's empathy connection is unexpected. Broadly, those roles are:

- *Processing interoceptive information.* As introduced in chapter 3, our brains monitor sensory information not only from outside us but from our internal world as well—interoceptive information about achy muscles, dry mouths, bowels in an uproar. If you unconsciously sense that your heart is racing and that makes you experience some emotion more intensely, thank the ACC. The ACC funnels literal gut feelings into intuitions and metaphorical gut feelings influencing frontal function. Pain is a key type of interoceptive information that catches the ACC's attention.[13]
- *Conflict monitoring*. The ACC responds to "conflict" in the sense of a discrepancy from what is expected. If you associate doing some behavior with a particular outcome, when that outcome doesn't occur, the ACC takes notice. This monitoring of discrepancy from expectation is asymmetrical—do some task that pays two brownie points and today, unexpectedly, you get

> three instead, and the ACC perks up and takes notice; do the task and instead of two brownie points you only get one, and the ACC activates like mad. In the words of Kevin Ochsner of Columbia University and colleagues, the ACC is an "all-purpose alarm that signals when ongoing behavior has hit a snag."[14]

Unexpected pain is at the intersection of those two roles of the ACC, a sure sign that things are amiss with your schema about the world. Even with anticipated pain, you monitor whether it turns out to be of the quality and quantity expected. As noted, the ACC doesn't concern itself with pedestrian concerns about pain (is it my finger or my toe that hurts?); that's the purview of less refined, more ancient brain circuitry. What the ACC cares about is the *meaning* of the pain. Good news or bad, and of what nature? Thus the ACC's perception of pain can be manipulated. Poke your finger with a pin and the ACC activates, along with those brain regions telling you which finger and what parameters of pain. Make someone believe that the inert cream you just smeared on his finger is a powerful painkiller, and when you poke his finger, the "it's my finger, not my toe" circuitry still activates. But the ACC falls for the placebo effect and stays silent.

Obviously the ACC receives inputs from interoceptive and exteroceptive outposts. Equally logically, it sends lots of projections into the sensorimotor cortex, making you very aware of and focused on the body part that hurts.

But the sophistication of the ACC, the reason it sits up there in the frontal cortex, is apparent when considering another type of pain. Back to chapter 6 and the Cyberball game where subjects in brain scanners play catch with a virtual ball on a computer screen, tossing it back and forth, and the other two players stop throwing the ball to you. You're being left out, and the ACC activates. Insofar as the ACC cares about the *meaning* of pain, it's just as concerned with the abstractions of social and emotional pain—social exclusion, anxiety, disgust, embarrassment—as with physical pain. Intriguingly, major depression is associated with various abnormalities in the ACC.* And the ACC is also involved during positive resonance—when their pleasure is your pleasure.[15]

All this makes the ACC sound pretty self-oriented, mighty concerned with your well-being. Which makes its empathy role initially surprising. Nonetheless, numerous studies consistently show that if someone else's pain—a poked finger, a sad face, a tale of misfortune—is evoking an empathic state in you, the ACC is

involved.[16] Moreover, the more painful the other person's situation seems to be, the more ACC activation. The ACC is also central to doing something to alleviate someone else's distress.

The neuropeptide/hormone oxytocin gets into the mix. Recall from chapter 4 how it promotes bonding and affiliative behaviors, trust, and generosity.* Recall the study in which prairie voles are observed consoling their stressed partner. And we'd expect, the effect depends on the actions of oxytocin. Remarkably, the oxytocin works in the ACC—selectively block oxytocin effects in the ACC, and voles don't console.

So how do we go from the ACC as this outpost of self-interest, monitoring your pain and whether you are getting what you think you deserve, to the ACC allowing you to feel the pain of the wretched of the earth? I think the link is a key issue of this chapter—how much is an empathic state actually about yourself?[17] "Ouch, that hurt" is a good way to learn not to repeat whatever you just did. But often, even better is to monitor someone else's misfortune—"That sure seems to have hurt her; I'm staying away from doing that." Crucially, the ACC is essential for learning fear and conditioned avoidance by observation alone. Going from "She seems to be having a miserable time" to "Thus I should avoid that" requires an intervening step of shared representation of self: "Like her, I wouldn't enjoy feeling that way." *Feeling* someone else's pain can be more effective for learning than just *knowing* that they're in pain. At its core the ACC is about self-interest, with *caring* about that other person in pain as an add-on.

Other brain regions are pertinent as well. As we saw, maturation of the circuitry of empathy involves bringing into the mix not only the ACC but the insula as well.[18] By adulthood the insula (and to a lesser degree the amygdala) is nearly as intertwined with experiencing empathy as is the ACC. The three regions are highly interconnected, and a big chunk of the amygdala texting the frontal cortex is funneled through the ACC. Numerous circumstances that evoke a sense of empathy, particularly physical pain, activate the insula along with the ACC, with the magnitude of the response correlating with the subject's basic proclivity toward empathy, or the subjective sense of empathy they are feeling in the situation.

This makes sense, given the workings of the insula and amygdala. As we saw, their involvement in empathic states emerges developmentally as kids first embed empathy in context and causality—*why* is this person in pain, and whose *fault* is it? This is obvious when pain is rooted in injustice, when disgust, indignation, and anger sweep in because we know that this pain could have been

prevented, that someone profited from it. Even when it is unclear that a cause of pain lies in injustice, we seek attribution—the intertwining of the ACC with the insula and amygdala is our world of scapegoating. And that pattern is so often there even when pain is random, without human agency or villainy—literal or metaphorical tectonic plates shift, the earth opens up and swallows someone innocent, and we rail against the people who deprived that victim of a happier life before the tragedy struck, against the God behind this act of God, against the mechanistic indifference of the universe. And as we will see, the more the purity of empathy is clouded with the anger, disgust, and indignation of blame, the harder it is to actually help.

The Cognitive Side of Things

When do the more cognitive components of an empathic state—the PFC, the dlPFC in particular, along with Theory of Mind networks such as the temporoparietal juncture (TPJ) and superior central sulcus—come more to the forefront? Obviously, and uninterestingly, when it's challenging to even figure out what's going on—"Wait, who won the game?" "Do I want my pieces to surround or be surrounded by the other person's?"

More interesting is when more cognitive brain circuitry is recruited by issues of causation and intentionality: "Wait, does he have a horrible headache because he's a migrant farm worker who was sprayed with pesticide, or because he's been binge drinking with his frat bros?" "Did this AIDS patient get his HIV from a blood transfusion or drug use? (People show more activation of the ACC for the former.) This is precisely what chimps have thought through when comforting an innocent victim of aggression but not an instigator. As we saw in chapter 7, the more cognitive profile of activation emerges when kids start distinguishing between self- and other-inflicted pain. In the words of Jean Decety, who did such research, this demonstrates that "empathic arousal [was] moderated early in information processing by a priori attitudes toward other people."[19] In other words, cognitive processes serve as a gatekeeper, deciding whether a particular misfortune is worthy of empathy.

It is also a cognitive task to resonate with pain that is less overt—for example, there is more engagement of the dmPFC when observing someone in emotional pain than physical pain. Likewise when the pain is presented more abstractly—a signal on a screen indicating that someone's hand has been stuck

with a needle versus the act itself being shown. Resonating with someone else's pain is also a cognitive task when it is a type of pain that you haven't experienced. "Well, I suppose I can understand the disappointment of this militia leader when he was passed over for the chance to carry out the ethnic cleansing—kinda like when I lost the election in kindergarten to be president of the random-act-of-kindness club." Now, that takes cognitive work. In one study subjects considered people suffering from a neurological disorder involving a novel type of pain sensitivity; empathizing for that novel pain involved more frontal cortical activation than for more conventional pain.[20]

As we saw, the rudimentary "empathy" of rodents is contingent, depending on whether the other individual is a cagemate or a stranger.[21] It is an enormous cognitive task for humans to overcome that, to reach an empathic state for someone who is different, unappealing. A hospital chaplain once described to me how he has to actively make sure that he is not preferentially visiting patients who were "YAVIS"—young, attractive, verbal, intelligent, or social. This is straight out of Us versus Them—recall Susan Fiske's work showing how extreme out-group members, such as the homeless or addicts, are processed differently in the frontal cortex than other people. And it is also straight out of Josh Greene's tragedy of the commons versus tragedy of the commonsense morality, where acting morally toward an Us is automatic, while doing so for a Them takes work.

The ease of empathizing with people like us starts at the level of autonomic building blocks of empathy—in one study of ritual fire walkers in Spain, heart rate changes in the walkers synchronized with spectators—but only those who were relatives. In line with that distinction, taking the perspective of a loved one in pain activates the ACC; doing the same for a stranger activates the TPJ, that region central to Theory of Mind.[22]

This extends to broader versions of Us versus Them. As introduced in chapter 3, we have a stronger sensorimotor response in our hands when the hand we see being poked with a needle is of our race; the stronger one's implicit in-group bias, the stronger this effect. Meanwhile, other studies show that the stronger the discrepancy in patterns of neural activation when observing an in-group versus an out-group person in pain, the lower the chances of helping the latter.[23] Thus it's no surprise that feeling the same degree of empathy or achieving the same level of perspective taking for a Them as for an Us requires greater frontocortical activation. This is the domain where you must suppress the

automatic and implicit urges to be indifferent, if not repulsed, and do the creative, motivated work of finding the affective commonalities.*[24]

Categorical boundaries to the extension of empathy also run along socioeconomic lines, but in an asymmetrical manner. What does that mean? That when it comes to empathy and compassion, rich people tend to suck. This has been explored at length in a series of studies by Dacher Keltner of UC Berkeley. Across the socioeconomic spectrum, on the average, the wealthier people are, the less empathy they report for people in distress and the less compassionately they act. Moreover, wealthier people are less adept at recognizing other people's emotions and in experimental settings are greedier and more likely to cheat or steal. Two of the findings were picked up by the media as irresistible: (a) wealthier people (as assessed by the cost of the car they were driving) are less likely than poor people to stop for pedestrians at crosswalks; (b) suppose there's a bowl of candy in the lab; invite test subjects, after they finish doing some task, to grab some candy on the way out, telling them that whatever's left over will be given to some kids—the wealthier take more candy.[25]

So do miserable, greedy, unempathic people become wealthy, or does being wealthy increase the odds of a person's becoming that way? As a cool manipulation, Keltner primed subjects to focus either on their socioeconomic success (by asking them to compare themselves with people less well off than them) or on the opposite. Make people feel wealthy, and they take more candy from children.

What explains this pattern? A number of interrelated factors, built around the system justification described in chapter 12—wealthier people are more likely to endorse greed as being good, to view the class system as fair and meritocratic, and to view their success as an act of independence—all great ways to decide that someone else's distress is beneath your notice or concern.

It is a particularly uphill battle when we are asked to empathize with the pain of people we dislike, whom we morally disapprove of—remember how their misfortune doesn't simply fail to activate the ACC but instead it activates mesolimbic dopamine reward pathways. Thus the process of taking their perspective and feeling their pain (as other than grounds for gloating) is a dramatic cognitive challenge rather than something remotely automatic.[26]

The cognitive "costs" of empathizing with someone distant are shown by increasing people's cognitive load (i.e., making their frontal cortex work harder by forcing it to override a habitual behavior)—they become less helpful to strangers but not to family members. "Empathy fatigue" can thus be viewed as

the state when the cognitive load of repeated exposure to the pain of Thems whose perspective is challenging to take has exhausted the frontal cortex. The notions of cognitive work and load also help explain why people are more charitable when contemplating one person in need than a group. To quote Mother Teresa, “If I look at the mass, I will never act. If I look at the one, I will.” Or to cite a quote attributed to someone who never seems to have achieved enough empathy to be vulnerable to empathy fatigue, Joseph Stalin: “The death of one man is a tragedy; the death of millions is a statistic.”[27]

And probably most reliably, those mentalizing pathways are activated when we switch from focusing on what it would feel like if this were happening to us to focusing on what it must feel like for them. Thus when subjects are *instructed* to switch from first- to third-person perspective, there’s not just activation of the TPJ but also frontal activation with the top-down regulatory task “Stop thinking about yourself.”[28]

Thus we have themes that closely resemble those from the last few chapters. When it comes to empathic states, “emotion” and “cognition” are totally false dichotomies; you need both, but with the balance between the two shifting on a continuum, and the cognition end of it has to do the heavy lifting when the differences between you and the person in pain initially swap the similarities.

Time now for one of the great sideshows in empathy science.

A MYTHIC LEAP FORWARD

In the early 1990s scientists at the University of Parma in Italy, led by Giacomo Rizzolatti and Vittorio Gallese, reported something that, depending on your tastes, ranged from really interesting to revolutionary. They had been studying an area of the brain called the premotor cortex (PMC) in rhesus monkeys, examining what sorts of stimuli would cause individual neurons there to activate. Back to the PMC from chapter 2. "Executive" neurons in the PFC decide something, passing the news to the rest of the frontal cortex just behind it. Which sends projections to the PMC just behind it. Which sends projections one step further back, to the motor cortex, which then sends commands to muscles. Thus the PMC straddles the divide between thinking about and carrying out a movement.[29]

The group had discovered some mighty quirky PMC neurons. Suppose a monkey carried out a behavior—grasping some food and bringing it to her mouth. Naturally, some neurons in the PMC would have activated. If she did a different movement—grasping an object and placing it in a container—a different (partially overlapping) array of PMC neurons were involved. What the group reported was that some of the bring-food-to-mouth neurons would also activate if the monkey *observed* someone else (monkey or human) making that movement. Same for some of the place-object-in-container neurons. Same for subtler movements like facial expressions. Consistently, about 10 percent of the PMC neurons devoted to doing movement X also activated when observing someone else doing movement X—very odd for neurons a few steps away from commanding muscles to move. The neurons were concerned with the mirroring of movements. And thus were "mirror neurons" announced to the world.

Naturally, everyone looked for mirror neurons in humans, and their existence in roughly the same part of the brain[*][30] was soon inferred with brain imaging studies ("inferred" because that approach tells you about the activity of large numbers of neurons at a time, rather than single ones). Then individual neurons were shown to be mirroresque in humans (in patients undergoing neurosurgery to control a rare type of epilepsy).[31]

The mirroring can be quite abstract. It can be cross-modal—see someone doing movement A, and some mirror neuron activates; hear the *sound* of someone doing movement A, and the same occurs. And the neurons can gestalt a scene, firing even if only part of the observed movement is obscured.[32]

Most interesting, mirror neurons didn't simply track movement. Find a mirror neuron that responds to the sight of someone picking up a cup of tea to drink. The sight of someone picking up the tea to clear the table doesn't activate it. In other words, mirror neurons can incorporate *intentionality* into their response.

Thus mirror neuron activity correlates with circumstances of imitation, either conscious or otherwise, including imitating the idea of an action, as well as the intent behind it. Nevertheless, no one has actually shown a causal relationship, that automatic or conscious mimicry requires mirror neuron activation. Moreover, the mirror neuron/imitation link is complicated by the cells having been first identified in rhesus monkeys—a species that does not show imitation of behavior.

But assuming that mirror neurons are indeed involved, the question becomes what purpose mimicry serves. Various possibilities have been raised and debated.

Probably the least controversial and most plausible is that mirror neurons mediate motor learning by observation.[33] Downsides of this theory, though, are that (a) mirror neurons do their thing in species with minimal learning by mimicry; (b) the amount of mirror neuron activity is unrelated to the efficacy with which observational learning of movements occurs; (c) to the extent that mirror neurons are needed for types of observational learning, it's a pretty low-level contribution in humans—after all, while we do learn how to carry out certain motoric acts by observation, far more interesting is our learning of context by observation—*when* to carry out that behavior (for example, observational learning may teach a subordinate primate the motoric features of kowtowing, but far more demanding and important is learning *whom* to kowtow to).

Related to that is the idea of mirror neurons aiding learning from another person's experience.[34] If you observe someone biting into food and they grimace at its taste, having mirror neurons at the intersection of observing that expression and experiencing it yourself will certainly make more vivid your understanding

that you should probably avoid that food. This is an idea advocated by Gregory Hickok of the University of California at Irvine, who, as we'll see, is a hard-nosed critic of mirror neuron flights of fancy.

This harks back to chapter 2 and Antonio Damasio's influential somatic marker hypothesis, the idea that when we are choosing among difficult options, the frontal cortex runs as-if experiments, canvassing your mind's and body's responses to doing X or Y—a thought experiment combined with a (gut) feeling experiment. Mirror neurons, with their putative attunement to how things worked out for observed individuals, would certainly weigh into this process.

Thus mirror neurons might be useful for learning the meaning of a movement, how to carry it out more effectively, and the consequences for someone else who did it. Nonetheless, such neuronal activity is neither necessary nor sufficient for observational learning, especially of the most interesting, abstract human kinds.

Then there's the next, more controversial realm, namely the idea that mirror neurons help you understand what someone else is thinking. This can range from understanding what behavior they are doing to understanding why they are doing it to grasping their larger motivations, all the way to peering into their souls with your mirror neurons. You can see why this has spawned debates.

In this view mirror neurons aid Theory of Mind, mind reading, and perspective taking, suggesting that part of how we understand someone else's world is by simulating (in our minds, in our PMC, in our mirror neurons) their actions.[35] This orients a mirror neuron's world in a very different way from the previous section, where mirroring is to improve your own motor performance and the most pertinent neuroanatomy about mirror neurons in the PMC is their talking to motor neurons that command muscles. In contrast, mirror neurons being concerned with understanding someone else's actions should be talking to Theory of Mind–related brain regions, for which there is evidence.

There was also the suggestion that mirror neuron–mediated perspective taking is particularly concerned with social interactions. Rizzolatti, for example, showed that mirror neuron activity was greater when the observed individual was closer.[36] But importantly, this isn't just literal distance but something resembling "social" distance; as evidence, mirror neuron activity would decrease if there was a transparent barrier between the observer and observed. In Gallese's words, "this shows the relevance of mirror neurons when mapping the potentialities for competition or cooperation between agent and observer."

The notion that mirror neurons aid us in understanding someone else's actions, leading to our understanding someone else, period, has been heavily criticized on two grounds, most notably by Hickok. First is the issue of causality—while some studies show that mirror neuron activity *correlates* with attempts at understanding someone else's perspective, there is minimal evidence that such activity *causes* the understanding. The second criticism concerns something obvious: we can understand the intent behind someone else's actions even if we can't remotely perform them ourselves. This would apply to actions of the observed individual ranging from pole-vaulting eighteen feet to explaining special relativity.

Supporters of this role for mirror neurons admit this but argue that they provide an extra level of understanding. Gallese writes, "I submit that it is only through the activation of Mirror Neurons that we can grasp the meaning of other's behavior *from within*"[37] (my emphasis). This is not my area of research, and I'm not trying to be snarky, but it seems like he's saying that there's understanding and then there's super-duper understanding, and the latter requires mirror neurons.

These mirror neuron speculations have been extended to focus on autism, a disorder in which there are profound impairments in understanding other people's actions and intentions.[38] According to the "broken mirror" hypothesis of mirror neuron pioneer Marco Iacoboni of UCLA, mirror neuron dysfunction underlies those aspects of autism. This has been examined by scads of researchers, with findings varying depending on the paradigm; most meta-analyses conclude that there is nothing flagrantly wrong with the formal features of mirror neuron function in autistic individuals.

Thus, while mirror neurons' activity correlates with attempts to understand other people's actions, their involvement seems neither necessary nor sufficient and is most pertinent to low-level, concrete aspects of such understanding. As for mirror neurons being the portal for peering into someone's soul and attaining super-duper understanding from within, I think things are best summarized by the title of Hickok's well-received 2014 book *The Myth of Mirror Neurons*.[39]

Which leads to the Wild West of mirror neuron–ology, with speculations that mirror neurons are essential to language, aesthetics, consciousness.[40] Most of all, within two seconds of people first hearing about mirror neurons, they started writing reviews where the last paragraph would say something like "Wow,

mirror neurons! How cool is that? This opens up all sorts of interesting avenues. Maybe they even explain . . . EMPATHY!"

Sure, why not? Feeling someone's pain is like mirroring their experience, feeling as if you are them. Tailor made, an irresistible idea. And in the decades since mirror neurons' discovery, the "maybe they even explain empathy" reviews have continued. Gallese, for example, nearly twenty years into the mirror neuron era, speculates: "I proposed the mirroring could be a basic functional principle of our brain and that our capacity to empathize with others might be mediated by embodied stimulation mechanisms [i.e., mirroring]." Iacoboni, at the same time, writes, "Mirror neurons are likely cellular candidates for the core layer of empathy." There have been some supportive hints—for example, people who self-report being particularly empathic show stronger mirror neuron–esque responses to matching movements. But for skeptics everything else is mere speculation.[41]

That's disappointing. But worse is people skipping over the "maybe" and concluding that mirror neurons have been *proven* to mediate empathy. Iacoboni, for example, mistakes correlation for causality: "Other studies, however, show that [PMC] activity correlates with empathy even when subjects watch grasping actions without overt emotional content. Thus, the mirror neuron activity is a *prerequisite* for experiencing empathy (my emphasis)."[42]

A flagrant example of this is the neuroscientist Vilayanur Ramachandran of UC San Diego, one of the most flamboyantly creative people in the business, doing fascinating research on phantom limbs, synesthesia, and out-of-body experiences. He's brilliant but has gotten a bit giddy with mirror neurons. A sampling: "We know that my mirror neurons can literally feel your pain." He's called them "the driving force behind the great leap forward" into human behavioral modernity sixty thousand years ago and famously said, "Mirror neurons will do for psychology what DNA did for biology." I'm not trying to harp on Ramachandran, but how can you resist someone brilliant handing out sound bites like calling mirror neurons "Gandhi neurons"? And this wasn't just in the first heady days of mirror neurons in the early 1990s. Two decades later he stated, "I don't think [the importance of mirror neurons for empathy is] being exaggerated. I think they're being played down, actually."[43]

Ramachandran is certainly not alone. British philosopher Anthony Grayling has gone for the empathy link big time, writing, "We have a great gift for empathy. This is a biologically evolved capacity, as shown by the function of 'mirror neurons.'" In a 2007 *New York Times* article about one man's heroic

actions to save another, those cells featured again: “People have ‘mirror neurons,’ which *make them* feel what someone else is experiencing” (emphasis added). And of course there was my daughter’s six-year-old classmate who, upon the class being complimented by their teacher for caring about the planet and cleaning up after their Earth Day cupcake celebration, shouted out, “It’s because our neurons have mirrors.”[44]

I’d like to think that I’m being a maverick here, ahead of the crowd in terms of crucial thinking, but in recent years most in the field have charged overhype. Psychologist Gary Marcus of NYU calls mirror neurons “the most oversold idea in psychology,” philosopher and neuroscientist Patricia Churchland of UCSD calls them the “darling of the don’t-look-too-closely crew,” and Harvard’s Stephen Pinker concludes, “Mirror neurons do not, in fact, explain language, empathy, society, and world peace.”[45] They simply haven’t been shown to have much to do with this chapter’s concerns.

THE CORE ISSUE: ACTUALLY DOING SOMETHING

The previous chapter considered the world of difference between highfalutin moral reasoning and whether, at a crucial juncture, someone actually does the right thing. As we saw, there is something consistent about that latter type of person: "What were you thinking when you leaped into that river to save the child?" "I wasn't; before I knew it, I'd jumped in." An act of implicit automaticity, the product of a childhood in which doing the right thing was ingrained as an automatic, moral imperative, light-years away from the frontal cortex calculating costs and benefits.

We face a similar situation here, one that is the core of this chapter. Sympathy versus empathy, "for" versus "as if," affect versus cognition, what we do versus what other species do—does any of this actually predict who *does* something compassionate to lessen someone's pains? Similarly, does any of this predict whether the person acting compassionately acts *effectively*, and how much it's an act of *self*-interest? As we'll see, there is a yawning gap between being in an empathic state and acting effectively in a way that is truly selfless.

Doing Something

It is far from guaranteed that an empathic state leads to a compassionate act. One reason for this is captured superbly by the essayist Leslie Jamison:

> *[Empathy] can also offer a dangerous sense of completion: that something has been done because something has been felt. It is tempting to think that feeling someone's pain is necessarily virtuous in its own right. The peril of empathy isn't simply that it can make us feel bad, but that it can make us feel good, which can in turn encourage us to think of empathy as an end in itself rather than part of a process, a catalyst.*[46]

In such a situation, saying "I feel your pain," becomes a New Age equivalent of the unhelpful bureaucrat saying, "Look, I sympathize with your situation, but . . ." The former is so detached from action that it doesn't even require the "but" as a bridge to the "there's nothing I can/will do." Having your pain validated is swell; having it alleviated is better.

And there's a broader reason why an empathic state may not produce action, first raised in chapter 6 when considering those strange creatures, adolescents. In that discussion I emphasized a wonderful feature of so many adolescents, namely the frenzied feeling of the world's pains, but noted how that intensity often leads to little more than frenzied self-absorption. If instead of imagining how someone else is feeling (an other-oriented perspective), you are imagining how it would feel if this were happening to you (a self-oriented perspective), "you" has just come to the forefront and the main point is that feeling someone's pain feels painful.

The biological substrates of this are clear. Look at someone in pain with the instruction to take a self-oriented perspective, and the amygdala, ACC, and insular cortex activate, along with reports of distress and anxiety. Do the same with an other-oriented perspective, and all are less likely. And the more extreme the former state, the more likely that someone's focus will be to lessen their own distress, to metaphorically look the other way.[47]

This can be predicted with remarkable ease. Expose subjects to evidence of someone else in pain. If their heart rate increases a lot (a peripheral indicator of anxious, amygdaloid arousal), they are unlikely to act prosocially in the situation. The prosocial ones are those whose heart rates decrease; they can hear the sound of someone else's need instead of the distressed pounding in their own chests.[*][48]

Thus, if feeling your pain makes me feel awful, I'm likely to just look out for number one, rather than helping you. Likewise if you've got your own issues. We saw this earlier, with the demonstration that if you increase people's cognitive load, they become less prosocial toward strangers. Similarly, when people are hungry, they are less charitable—hey, quit bellyaching about your problems; my belly is aching. Make people feel socially excluded and they become less generous and empathic. Stress has the same effect, working via glucocorticoids; Mogil's group (with my involvement) recently showed that if you use a drug to block glucocorticoid secretion, both mice and humans become more empathic toward strangers. Thus, if you feel highly distressed, whether due

to resonating with someone else's problems or because of your own, tending to your own needs readily becomes the priority.[49]

In other words, empathic states are most likely to produce compassionate acts when we manage a detached distance. This brings to mind the anecdote from many chapters ago about the Buddhist monk I encountered who said that, yes, sometimes he cuts short his cross-legged meditation because of his knees, but not because he feels them hurting—"I do it as an act of kindness to my knees." And this is certainly in line with the Buddhist approach to compassion, which views it as a simple, detached, self-evident imperative rather than as requiring vicarious froth. You act compassionately toward one individual because of a globalized sense of wishing good things for the world.[*]

A handful of fascinating studies of Buddhist monks have been carried out, both by Richard Davidson of the University of Wisconsin and Tania Singer of the Max Planck Institutes in Germany. Remarkably, given the science-versus-religion culture wars, such work was given its, er, blessing and facilitated by the Dalai Lama, who is famously intrigued by neuroscience and who has said that if his Dalai Lama gig hadn't come up, he would have wanted to be a scientist or engineer. The most publicized work revolves around the neuroimaging of Matthieu Ricard, a French-born Buddhist monk (who is the Dalai Lama's French translator and who just happens to have a PhD in molecular biology from the Pasteur Institute—this is one interesting guy).[50]

When confronted with examples of human suffering and instructed to empathically feel the pain of those people, Ricard showed activation of the same circuitry as you'd see in most everyone else. And it was extremely aversive—"The empathic sharing very quickly became intolerable to me and I felt emotionally exhausted," he explained. When instead he did his Buddhist thing, focusing on thoughts of compassion, a totally different picture of activation emerged—the amygdala was silent, and instead there was heavy activation of the mesolimbic dopamine system. He described it as "a warm positive state associated with a strong prosocial motivation."

In other studies volunteers underwent either empathy training (focusing on feeling the pain of someone in distress) or compassion training (focusing on a feeling of warmth and care toward that distressed person).[51] The former would generate the typical neuroimaging profiles, including heavy amygdala activation, and a negative, anxious state. Those with compassion training did not, showing heavy activation instead in the (cognitive) dlPFC, coupling of activation between

the dlPFC and dopaminergic regions, more positive emotions, and a greater tendency toward prosociality.

Okay, caveats. This is a tiny literature (i.e., not much larger than the study of Ricard). And all-star Buddhist monks apparently meditate eight hours a day, not a trivial path to take. The point is merely to emphasize this scenario of detachment. Which brings us to the next issue, which is whether compassionate acts fostered by empathy are necessarily useful.

Doing Something Effectively

In a provocatively titled 2014 article, "Against Empathy," Paul Bloom explored the ways in which empathy can lead to compassionate acts that are far from ideal.

There is the realm of what has been termed "pathological altruism," the type associated with codependency.[52] This is the scenario of someone so consumed with the vicarious pain of a loved one that they endure and facilitate his dysfunction rather than administering tough love. Then there's the danger that the empathic pain is so intense that you can only come up with solutions that would work for you, rather than ones that might help the sufferer. And there is the problem of empathy impeding your doing what's necessary—it's not great if a parent is so vicariously distressed by their child being distressed that they forgo vaccinations. A large piece of the training of health-care professionals is teaching them to keep empathy at bay.* For example, the various behavioral and neurobiological responses to seeing someone poked with a needle do not occur in acupuncturists. As Jamison describes, when anxiously seeing a doctor about something worrisome, "I needed to look at him and see the opposite of my fear, not its echo."

Bloom also emphasizes how highly aroused empathy pushes us toward psychologically easy acts that generate the least cognitive load. In those times suffering that is local, that concerns an identified appealing individual, and that is of a type with which you're familiar readily counts for more than suffering that is distant, involves a group, and is an alien form of pain.* Aroused empathy produces tunnel-visioned compassion that can wind up misplaced. As the philosopher Jesse Prinz emphasizes, the point is not whose pain pains us the most but who most needs our help.

Are There Ever Any Bloody Altruists?

Stop the presses; science has proven that it can feel good to do good, complete with activation of the mesolimbic dopamine system. This doesn't even require a brain scanner. In a 2008 study in *Science*, subjects were given either five dollars or twenty dollars; half were instructed to spend it that day on themselves, half on someone else (ranging from a friend to a charity). And comparisons of self-assessments of happiness at the beginning and end of the day showed that neither the larger amount of money nor the opportunity to spend it on oneself increased happiness; only spending it on someone else did. And particularly interesting is that other subjects, told about the design, predicted the opposite—that happiness would be raised most by spending on oneself, and that twenty dollars would buy more happiness than five.[53]

The question, of course, is why doing good can feel good, which raises the classic question: is there ever a selfless act that contains no element of self-interest? Does doing good feel good because there's something in it for you? I'm sure not going to tackle this from a philosophical perspective. For biologists the most frequent stance is anchored in chapter 10's evolutionary view of cooperation and altruism, one that always contains some element of self-interest.

Is this surprising? Pure selflessness is clearly going to be an uphill battle if the very part of the brain most central to an empathic state—the ACC—evolved to observe and learn from others' pain for your own benefit.[54] The self-oriented rewards of acting compassionately are endless. There's the interpersonal—leaving the beneficiary in your debt, thus turfing this from altruism to reciprocal altruism. There are the public benefits of reputation and acclaim—the celebrity swooping into a refugee camp for a photo op with starving kids made joyful by her incandescent presence. There's that strange version of reputation that comes in the rare cultures that have invented a moralizing god, one who monitors human behavior and rewards or punishes accordingly; as we saw in chapter 9, it is only when cultures get large enough that there are anonymous interactions among strangers that they tend to invent moralizing gods. A recent study shows that across a worldwide range of religions, the more people perceive their god(s) to monitor and punish, the more prosocial they are in an anonymous interaction. Thus there is the self-interested benefit of tipping the cosmic scale in your favor. And probably most inaccessibly, there is the purely internal reward of altruism—the warm glow of having done good, the lessened sting of guilt, the increased

sense of connection to others, the solidifying sense of being able to include goodness in your self-definition.

Science has been able to catch the self-interest component of empathy in the act.[55] As noted, some of the self-interest reflects concerns about self-definition—personality profiles show that the more charitable people are, the more they tend to define themselves by their charitability. Which comes first? It's impossible to tell, but highly charitable people tend to have been brought up by parents who were charitable and who emphasized charitable acts as a moral imperative (particularly in a religious context).

How about the self-interested reputational rewards of being altruistic, the cachet of conspicuous largesse rather than conspicuous consumption? As emphasized in chapter 10, people become more prosocial when reputation rides on it, and personality profiles also show that highly charitable people tend to be particularly dependent on external approval. Two of the studies just cited that showed dopaminergic activation when people were being charitable came with a catch. Subjects were given money and, while in a brain scanner, decided whether to keep the money or donate. Being charitable activated dopamine "reward" systems—when there was an observer present. When no one was present, dopamine tended to flow most when subjects kept the money for themselves.

As emphasized by the twelfth-century philosopher Moses Maimonides, the purest form of charity, the most stripped of self-interest, is when both the giver and the recipient are anonymous.* And, as shown in those brain scanners, this is perhaps the rarest form as well.

Intuitively, if good acts must be motivated by self-interest, the reputational motive, the desire to be the biggest spender at the charity auction, seems most worthy of irony. In contrast, the motivation to think of yourself as a good person seems a pretty benign one. After all, we're all searching for a sense of self, and better that particular sense than to assure yourself that you're tough, scary, and not to be messed with.

Is the element of self-interest ever truly absent? One 2007 study in *Science* examined this.[56] Subjects (in brain scanners, of course) were unexpectedly given varying amounts of money. Then, some of the time they were "taxed" (i.e., told that a certain percentage of that money would be forcibly given to a food bank), some of the time given the opportunity to donate that amount voluntarily. In other words, the exact same amount of public "good" was accomplished in each

case, but the former constituted enforced civic duty while the latter was a purely charitable act. Thus, if someone's altruism is purely other-oriented, without a smidgen of self-interest, the two circumstances are psychologically identical—those in need are being helped, and that's all that matters. And the more different the scenarios feel, the more self-interest is coming into play.

The results were complex and interesting:

a. The more people's dopaminergic reward systems activated when they unexpectedly received money, the less activation there was when they were either taxed or asked to donate. In other words, the greater the love of money, the more painfully it is parted with. No surprise there.

b. The more dopaminergic activation there was when someone was taxed, the more voluntarily charitable they were. Being taxed could not have been welcome to the most self-interested—money was being taken from them. For subjects who instead showed heavy activation of dopaminergic systems in that circumstance, any self-interest of losing money was more than compensated for by the knowledge that people in need were being helped. This taps into the last chapter's exploration of inequity aversion and is consistent with findings that in some circumstances, when a pair of strangers are openly given unequal amounts of reward, there is typically dopaminergic activation in the one with the good luck when some of the reward is transferred afterward to make things more even. Thus it's little surprise in the present study that subjects made happy by reducing inequity, even at a cost to themselves, were also the most charitable. The authors appropriately interpret this as reflecting a compassionate act with elements independent of self-interest.[57]

c. There was more dopaminergic activation (and more self-reports of satisfaction) when people gave voluntarily than when they were taxed. In other words, a component of the charitability was about self-interest—it was more pleasing when those in need were helped by voluntary efforts than when giving was forced.

What does this show? That we're reinforced by varying things and to varying extents—getting money, knowing that the needy are being cared for, feeling the warm glow of doing a good thing. And that it is rare to be able to get the second type of pleasure with no dependence on the third—it appears to truly be rare to scratch an altruist and see an altruist bleed.

CONCLUSIONS

All things considered, it is a pretty remarkable thing that when an individual is in pain, we (i.e., we humans, primates, mammals) often are induced to be in a state of pain also. There have been some mighty interesting twists and turns for that one to have evolved.

But at the end of the day, the crucial issue is whether an empathic state actually produces a compassionate act, to avoid the trap of empathy being an end unto itself. The gap between the state and the act can be enormous, especially when the goal is for the act to be not only effective but also pristine in its motives.

For someone reading this book, a first challenge in bridging that gap is that much of the world's suffering is felt by distant masses experiencing things that we haven't an inkling of—diseases that don't touch us; poverty that precludes clean water, a place to live, the certainty of a next meal; oppression at the hands of political systems that we've been spared; strictures due to repressive cultural norms that might as well be from another planet. And everything about us makes those the hardest scenarios for us to actually act—everything about our hominin past has honed us to be responsive to one face at a time, to a face that is local and familiar, to a source of pain that we ourselves have suffered. Yes, best that our compassion be driven by the most need rather than by the most readily shared pain. Nevertheless, there's no reason why we should expect ourselves to have particularly good intuitions when aiming to heal this far-flung, heterogeneous world. We probably need to be a bit easier on ourselves in this regard.

Likewise, we should perhaps ease up a bit on the scratching-an-altruist problem. It has always struck me as a bit mean-spirited to conclude that it is a hypocrite who bleeds. Scratch an altruist and, most of the time, the individual with unpure motives who bleeds is merely the product of "altruism" and "reciprocity" being evolutionarily inseparable. Better that our good acts be self-serving and self-aggrandizing than that they don't occur at all; better that the myths we construct and propagate about ourselves are that we are gentle and giving, rather than that we prefer to be feared than loved, and that we aim to live well as the best revenge.

Finally, there is the challenge of a compassionate act being left by the wayside when the empathic state is sufficiently real and vivid and awful. I'm not advocating that people become Buddhists in order to make the world a better place. (Nor am I advocating that people *don't* become Buddhists; what is the sound of one atheist waffling?) Most of us typically require moments of piercing, frothing shared pain to even notice those around us in need. Our intuitions run counter to doing it any other way—after all, just as one of the most frightening versions of humans at their worst is "cold-blooded" killing, one of the most puzzling and even off-putting of us at our best is "cold-blooded" kindness. Yet, as we've seen, a fair degree of detachment is just what is needed to actually act. Better that than our hearts racing in pained synchrony with the heart of someone suffering, if that cardiovascular activation mostly primes us to flee when it all becomes just too much to bear.

Which brings us to a final point. Yes, you don't act because someone else's pain is so painful—that's a scenario that begs you to flee instead. But the detachment that should be aimed for doesn't represent choosing a "cognitive" approach to doing good over an "affective" one. The detachment isn't slowly, laboriously thinking your way to acting compassionately as an ideal utilitarian solution—the danger here is the ease with which you can instead think your way to conveniently concluding this isn't your problem to worry about. The key is neither a good (limbic) heart nor a frontal cortex that can reason you to the point of action. Instead it's the case of things that have long since become implicit and automatic—being potty trained; riding a bike; telling the truth; helping someone in need.