

Index

- ACC. *see* anterior cingulate gyrus
 Adderall, 172
 addiction
 gambling as an, 139
 narcotics, 53, 101. *see also specific drug*
 neuroplasticity and, 43–4
 sexual, 101
 adrenal gland, 89
 adults, lying in, 115–16
 affective processing
 abnormalities in, 67
 empathy and, 87
 aggression. *see also* assaults
 gene for, 63, 64
 testosterone and, 91
 alcohol, as trigger for violence, 49–54
 alcoholism, 53, 56
 alleles
 abnormal, 154
 on transporter gene, 64
 amblyopia, neuroplasticity and, 43
 amphetamine use, 56
 amygdala, 34–6
 activity during moral dilemma, 41
 conditioned fear and, 35, 127
 damaged, behavioral sequelae of, 128–9,
 130
 social awareness and, 93, 195n.26
 social bonding and, 105
 testosterone receptor cells and, 100–1
 threat-response system and, 65
 variable responses in individuals, 127,
 141
 visual system and, 101
 in Williams syndrome children, 31
 anarchic hand syndrome, 70, 166
 androgen insensitivity syndrome (AIS),
 194n.22
 androgens, 90
 anger, 4
 animals. *see also* prairie vole
 abuse of, 55, 63
 homosexuality among, 108–9
 social instinct in, 7–8
 testosterone level studies, 111
 anterior cingulate cortex (ACC), 35, 36–7,
 130, 183n.17
 in pathological gamblers, 139–40
 anterior cingulate gyrus, 120
 and expectation, 131–2
 anterior commissure, 86, 109
 antidepressants, 13, 110
 antisocial personality disorder, 46, 79, 152,
 153
 addictive behaviors associated with, 53
 definition, 186n.3
 developmental defects and, 67
 ants, ecology of, 23, 180n.31
 approach inhibition, in Williams syndrome
 children, 30–1
 Aquinas, Thomas, 21, 117
 Aristotle, 21
 assaults, by Ricky Green, 49–54
 association areas, 38–9
 attachment
 children and, 17–19
 neurochemicals associated with, 112
 romantic love and, 104–5
 attention association area. *see* prefrontal
 cortex
 attraction, human, neuroimaging studies of,
 103
 Augustine, Saint, 117
 Austen, Jane, *Pride and Prejudice*, 4
 autism, bonding and, 19
 autonomic responses, to gains and losses,
 125–6
 avarice. *see* greed

Index

- “badness.” *see under* “madness”
 Baron-Cohen, Simon, *The Essential Difference*, 86–7, 88, 101, 193n.10
 Bartels, A., 104–5
 Bateson, Gregory, 145
 bedwetting, 55
 behavior. *see also specific behaviors*
 individual control and, 69–70
 motivated, evolutionary advantage of, 137
 social, in animals, 7–8
 societal perceptions of, 7
 behavioral modification, 173
 behavioral neurogenetics, 33
 behaviorism, 22–3
 mental illness and, 145
 Bell, Clive, 174
 bigamy, 118–19
 bipolar illness, 137
 Bok, Sissela, 117
 bonding
 autism and, 19
 maternal, 145
 parent–child, 18–19
 social, neurochemicals of, 105
 Bowlby, John, 18
 brain
 dopamine effects of, 133–5
 emotional, 34–7
 gender differences in, 86–93
 limbic structures of, 7
 moral choices affected by, 76
 moral thinking and, 1–2
 plasticity of, 42–5, 163
 prefrontal cortex and, 128
 in schizophrenia, 146
 as template, 29
 testosterone and, gender differences, 89, 91, 194n.22
 transplanting parts of, 169
 uploading information to, 170
 variable responses in individuals, 141
 brain abnormalities, studies on, 32
 brain activity
 measuring, 26–7. *see also* functional MRI
 moral dilemmas and, 41–2
 synchronization of, 72
 brain biology, 2
 aberrant actions directed by, 160–1
 in context of evolutionary psychology, 6–7
 “cultural biology” and, 24
 genetics and, 127
 language development and, 29–30
 manipulating for social control, 173
 mental illness and, 146–7
 moral precepts and, 9
 natural law and, 22
 psychiatric illness and, 13
 Seven Deadly Sins and, 4–5, 9–11
 brain fingerprinting, 122
 brain implants, 169
 brain injuries
 behavioral sequelae of, 78–80
 cognitive deficits and, 74
 studies on, 31–2
 brain scans, infrared, 122
 Brazelton, T. Barry, 15
 Broca, Paul, and Broca’s area, 82
 Bundy, Ted, 48

Canterbury Tales (Chaucer), 4
 “capital vices.” *see* Seven Deadly Sins
 capuchin monkey studies, 80–1
 case examples
 deception by bigamist, 118–19
 extramarital relationship, 28–9
 obsessive sexual behavior, 84–6, 91–3, 95–6, 99–100, 106–7
 psychopath, 46–61
 stored representations, 28–9
 Cassian, John (saint), 3
 caudate nucleus, 98, 102, 131, 181n.15
 cerebral cortex
 conscious decisions and, 26
 long-term memory and, 126
 Chaucer, Geoffrey, *Canterbury Tales*, 4
 children
 aggression in, Dutch family research study, 63–4
 attachment and, 17–19
 developmental stages of, 178n.6
 emotional stress in, 54–5, 63
 lying in, 114–15, 120
 maternal killing of, 149–51
 moral development in, 14–17
 sense of fairness in, 77–8
 sexual interest by adults in, 110
 suspect behaviors in, 55, 63
 Chomsky, Noam, 29–30, 82
 chromosomal abnormalities
 in schizophrenia, 147
 in Williams syndrome children, 31
 CIA, lie detection needs of, 121–2
 cingulate cortex
 social awareness and, 93
 social bonding and, 105
 cingulate gyri, responses
 expectation and, 131–2
 to gain rewards, 130–1
 cingulotomies, 173
 claustrum, 98, 101
 Cleckley, Hervey, *The Mask of Sanity*, 47
 cocaine addiction, 9, 101, 102
 cognitive behavior therapy (CBT), in stroke victims, 44

Index

- cognitive functioning
 brain areas associated with, 93
 corpus callosum and, 78
 empathy and, 87
 community, evolution of, 6
 compulsive lying, 115
 computer chip implants, 169
 conditioned fear, 124–5
 amygdala and, 35, 182n.3
 fMRI study of, 64, 127
 conditioning, Pavlovian experiments of, 134
 congenital adrenal hyperplasia, 90
 conscience, 23, 180n.27
 development in children, 77–8
 conscious decisions
 measuring, 26–7
 personal vs. subpersonal explanations for, 71–2
 conventional level, of moral development, 16–17, 165
 corporate scandals, 135–8
 corpus callosum, cognitive functioning and, 78
 cortisol, 154
 “covert biases.” *see* hunches
 criminal acts
 among mentally ill, 147–8
 of Ricky Green. *see* Green, Ricky
 “cultural biology,” 24
 current sensory data, 27
- Damasio, Antonio, 72, 112, 159, 165
 Dante, *Divine Comedy*, 3–4
 Darwin, Charles, 7–8
 Dawkins, Richard, 8
 deception. *see also* lying
 cheating, 123
 conning, 47
 minor. *see* “white lies”
 during wartime, 118
 decision making
 bad, responsibility and, 141–2
 bipolar illness and, 137
 body sensation and, 76
 complex, 75
 compromised, brain injuries and, 128–9, 130
 financial. *see* monetary decisions
 inhibitory mechanism and, 40–1
 moral judgments and, 157–9
 rational, 159
 simple, 74–5
 delusions, 148–9
 Dennett, Daniel C., 71–2
 depression
 postpartum, 149–50
 sloth and, 10
- deprivation studies, 153
 Descartes, René, 25
 developmental defects, antisocial behavior and, 67
 developmental stages, of Piaget, 178n.6
 deviant sexuality, cultural differences and, 19
 de Waal, Frans, 8
 Good Natured, 120
 diethylstilbestrol (DES), 90
 Dietz, Park, 150–1
Divine Comedy (Dante), 3–4
 domination, sexual, 57
 dopamine system, 103, 133–5
 in paraphiliacs, 110
 in pathological gamblers, 140–1
 in sexual arousal, 98
 “double bind” theory, 145
 “double lives,” 200n.7
 downloading information, to brain, 170
 drug abuse, 58. *see also specific drug*
 “dysbindin” gene, 147
- EEG. *see* electroencephalography
 “Ego,” Freudian concept, 15–16
 ejaculation studies, 101, 102
 electroencephalography (EEG), 26
 for lie detection, 122
 emotional stress, in childhood, 54–5, 63
 emotions, 5–6, 7. *see also specific emotion*
 amygdala and, 93, 124
 brain areas associated with, 34–7, 93
 memories and, 125–6
 empathy, 57, 87, 112–13
 females and, 88
 gender differences, 112
 Enron, 136
 entorhinal cortex, 149
 environment
 brain influenced by, 24
 changes in, and gender roles, 89
 child development and, 21
 emotional responses to, 7
 moral development and, 81–3
 enzyme deficiencies, 90
 equality
 “inequity aversion” and, 192n.36
 primate studies on, 80–1
 erotic film, 97–8
 erotic stimuli, gender differences in, 97
The Essential Difference (Baron-Cohen), 86–7, 88, 101
 estrogen levels, prenatal, sexual orientation and, 109
 eugenics, 175
 euphoria, 102, 134
 event-related potentials, 26

Index

- evil
 confronting, 2–3
 eradication of, 173
 immoral acts as anchor for, 4–5
 evolutionary psychology, 6
 development of social morality and, 8
The Executive Brain (Goldberg), 38
 expectation, cingulate gyrus responses and, 131–2
 experience, moral development and, 82–3

The Faerie Queene (Spenser), 4
 failure, pathological fear of, 137
 fairness
 concept of, 77–8
 experience of, 82–3
 gender differences in, 80
 and “inequity aversion,” 192n.36
 primate studies on, 80–1
 FBI, lie detection needs of, 121–2
 fear. *see also* conditioned fear
 of failure, pathological, 137
 responses to, 38, 65, 125, 132
 “fight or flight” reaction, 38, 65, 125, 132
 financial decisions. *see* monetary decisions
 fire, fascination with, 55
 Fisher, Helen, 104–5
 flattery, false, as “white lie,” 117
 fMRI. *see* functional MRI
 food sensitivity, 10
 forensic psychiatrists, testimony of, 150–1
 “free will,” 8, 164
 decision making and, 75
 moral choice and, 13
 neuropathology and, 69–70
 psychopaths and, 47
 unconscious processes and, 166–7
 Wegner and Dennett on, 71–2
 “freeze” response, 65
 Freud, Ana, 115
 Freud, Sigmund, 15–16, 145, 167, 178n.5
 psychoanalytical approach of, 22
 research limitations of, 20
 frontal lobes, 37–40. *see also* prefrontal cortex
 controlling aggression, 67
 deficit in, social awareness and, 93
 left, language development and, 82
 limbic structures and, 128–9, 165
 monetary decisions and, 127–8
 variable responses in individuals, 141
 frontal lobotomy, 173
 functional MRI (fMRI), 71
 in adolescents, 78
 amygdala activation, 125, 127
 conditioned-fear responses, 64
 future use of, 167–8
 human attraction, 103
 for lie detection, 122–3
 in lying studies, 120–1
 personal moral judgments, 158
 in psychopaths, 94
 romantic love, 105
 schizophrenics, 146
 sexual arousal, 97–8
 social awareness and cohesiveness, 94

 Gage, Phineas, 67
 gains
 anterior cingulate gyrus responses to, 130–1
 brain activity and, 27
 hypothalamus activation, pheromones and, 109
 monetary, dopamine system and, 133, 134
 responses in amygdala to, 125
 unexpected, 133
 gambling
 pathological, 138–42
 prefrontal cortex or amygdala injury and, 129
 gender differences
 brain, 86–93
 empathy, 112
 fairness, 80
 lying, 116
 sexual arousal, 97, 102
 testosterone in brain, 89, 91, 194n.22
 gender roles
 changes in, 88–9
 in primates, 89
 genes
 abnormal, in Williams syndrome children, 31
 moral development and, 29
 Genesis, Fall of Man, 2
 genetic engineering, 168
 genetics. *see also* behavioral neurogenetics
 brain biology and, 127
 child development and, 20–1
 differences, studies on, 32
 mental illness and, 146–7
 genetic tests, future use of, 167–8
 genetic therapy, 168
 genitalia, ambiguous/virilized, 90
Getting Away with Murder (play), 4
 Giedd, Jay, 78
 Gilligan, Carol, 17
 glibness, 48
 Glimcher, Paul, 27, 70–1, 167
 glucose metabolism, 152–3
 gluttony, obesity and, 9–10
 Goldberg, Elkhonen, *The Executive Brain*, 38
 good and bad. *see* right and wrong

Index

- Good Natured* (de Waal), 8
A Good Start in Life (Herschkowitz and Herschkowitz), 77–8
 gorillas, lying in, 120
 Gray, J., *Men Are from Mars, Women Are from Venus*, 86
Great and Desperate Cures (Valenstein), 173
 greed, 4–5
 corporate scandals involving, 135–8
 Green, Ricky, case history of, 46, 48–9, 186n.1
 assaults and murders, 49–54
 dynamics, 65–6
 family background, 54–6
 homosexual sexual encounters, 58–9
 interpretations, 59–61
 relationships, 56–8
 Gregory the Great (pope), 3
 guilt, 7
 Gunn, John, 148

 hallucinations, 148–9
 Hamilton, W. D., 23
 Hare, R. D., 47–8
 heroin addiction, 9, 101
 Herschkowitz, Norbert and Elinore, *A Good Start in Life*, 77–8
 heterosexuality, 108
 hippocampus, 35, 36
 autonomic responses and, 125–6
 memory and, 36, 183n.8
 Hippocrates, *The Sacred Disease*, 12
 homeostasis, 37
 Homer, *Iliad*, 144
 homicides. *see* murders
 homosexuality, 108–9
 Hubel, David, 43
 Human Genome Project, 175
 hunches, 129–30, 132
 Huxley, Thomas, 8
 hyperorality, in Klüver–Bucy syndrome, 98–9
 hypersexuality, in Klüver–Bucy syndrome, 98–9
 hypersociability, in Williams syndrome children, 30–1
 hypothalamus, 35, 36–7
 pheromones and, 109
 sexual arousal and, 97, 98, 101

 “Id,” Freudian concept, 15–16
 idiopathic hypogonadotropic hypogonadism (IHH), 194n.22
 idiot savant, 69
Iliad (Homer), 144
The Illusion of Conscious Will (Wegner), 71–2

 ImClone Corporation, 136
 imitation behavior, 70
 mirror-neuron system and, 40–1
 immoral acts
 as anchor for evil, 4–5
 changing societal perceptions of, 7
 depicted in Western literature, 4
 impulsivity
 in children, 65
 in psychopaths, 48
 incest, 54–5
 cultural differences and, 19
 “inequity aversion,” 192n.36
 infanticide, 149–51
 inferior parietal lobule, 40
 information
 downloading and uploading to brain, 170
 sequential, mirror-neuron system and, 40–1
 infrared brain scans, 122
 inhibition, in children, 65
 inhibitory networks, 40. *see also* anterior cingulate cortex; hippocampus
 input–operation–output relationships. *see* systemizing
 insanity
 criminal responsibility and, 178n.3
 test of, 156
 insanity plea, 156–7
 instinct(s)
 Freud on, 22, 178n.5
 for self-preservation. *see* lying
 social, in animals, 7–8
 institutions, behavior of psychopaths in, 48
 instruction mechanism, moral development and, 81–3
 insula, 37, 101, 105, 131
 insular cortex, 97, 104, 105
 intelligence, of psychopaths, 48
 intention
 cognitive nature of, 71–2
 retrospective nature of, 71, 72
 interactionism, moral development and, 192n.40
 interpersonal psychotherapy (ITP), in stroke victims, 44
 investment decisions. *see* monetary decisions

 Judeo-Christian tradition
 proscriptions of, 8–9
 social morality and, 2
 in Western literary works, 3–4

 Kant, Immanuel, 117
 Kety, Seymour, 146
 Keynes, John Maynard, 174

Index

- Klüver–Bucy syndrome, 98–9
 Kohlberg, Lawrence, 16–17
 research limitations, 20
 Koko (gorilla), 120
 Kozlowski, L. Dennis, 136
 Kraepelin, Emil, 146
 kuru, 179n.18
- Langleben, Daniel, 120–1
 language developmental, 29–30, 82
 lateral central tegmental field, 101
 laterality effect, in brain hemispheres, 91
 Lay, Kenneth, 136
 laziness, pathological, depression and, 10
Liars, Lovers, and Heroes (Quartz and Sejnowski), 24
 Libet, Benjamin, 70–1, 167
 mind–body association and, 25–6
 libido, testosterone and, 10–11
 Lidz, Theodore, 145
 lie detection, 121–3
 limbic structures, of brain, 7, 34–7. *see also*
 amygdala; anterior cingulate cortex;
 hippocampus; hypothalamus
 frontal lobes and, 128–9, 165
 prefrontal cortex and, 128–9
 sexual behavior and, 100–7
 literary works, immoral acts depicted in, 4
 lobotomy, frontal, 173
 losses, responses to
 of amygdala, 125
 of anterior cingulate gyrus, 130–1
 love. *see* bonding; romantic love
 lust, 4, 100, 112
 testosterone and, 10–11
 lying
 in adults, 115–16
 benefits of, 119
 in children, 114–15, 120
 compulsive, 115
 defined, 116–17
 detecting, 121–3
 “double lives” and, 200n.7
 gender differences in, 116
 innocuous, 117–18. *see also* “white lies”
 natural selection and, 114, 119–21
 in psychopaths, 47
 reasons/motivation for, 115, 136
 serious, 118
 spectrum of, 117–18
 studies of, 120–1
- “madness,” and “badness”
 categorization, 160–1
 definitions of, 144–7
 differences/similarities between, 143, 160
 future management of, 163–4
 historic views of, 144–5
- magnetic resonance imaging (MRI),
 32–3
 in delusional patients, 149
 functional. *see* functional MRI
 studies using, 153
 manic–depressive illness, genetic studies in,
 147
 MAO-A. *see* monoamine oxidase-A
 marijuana, 9, 56
 Marx, Karl, 22
 masculinization, adrenal steroid, 90
The Mask of Sanity (Cleckley), 47
 medial preoptic area, sexual arousal and,
 98, 101
 medial ventral thalamus, 101
 medications, causing sexual dysfunction,
 110
 memory(ies)
 brain transplants and, 169
 hippocampus and, 36, 125–6, 183n.8,
 202n.9
 perirhinal cortex and, 202n.9
Men Are from Mars, Women Are from
Venus (Gray), 86
 mental illness
 behaviorism and, 145
 biology and genetics of, 146–7, 151–2
 diagnostic criteria for, 156
 responsibility and, 160
 right and wrong and, discriminating
 between, 150, 156
 violence and, 147–8
 mentalism
 attachment theories and, 17–19
 physicalism vs., 12, 20
 proponents of, 14–17
 mesodiencephalic transition zone, 101
 Michael (gorilla), 120
 mind, traditional notions of, 1
 mind–body association, 25–6
 studies on, 31–3
 mind–body dichotomy, 1
 mirror-neuron system, 40–1, 185n.32
 Mitchell, Major, 154–6
 M’Naughten rule, 151, 156
 monetary decisions
 amygdala activation and, 126–7
 brain areas affecting, 124
 corporate scandals involving, 135–8
 prefrontal cortex in, 127–8
 monoamine oxidase-A (MAO-A)
 aggressive gene and, 63–4
 violence and, 154, 164
 monoaminergic dysregulation, in
 paraphilias, 110
 moral brain
 creating, 167–71
 mirror-neuron system in, 40–1

Index

- moral choices/judgments, 75–6
 brain activity and, 191n.32
 crying baby scenario, 158–9
 dilemmas in, 41–2, 73–4
 impersonal, 157–8
 personal, 157
 psychiatric illness and, 13–14, 178n.3
 runaway trolley scenario, 157–8
- moral development
 biology of, 165–6
 of children, 14–17, 19–21
 experience and, 82–3
 Kohlberg's levels of, 16–17
 nature vs. nurture in, 81–3, 192n.40
 “moral idiots,” 46
- morality. *see also* social morality
 attachment as basis for, 17–19
 foundation for, 29
 innate sense of, 77–81
 roots of, 5
 of sexual behavior, 111–13
 streamlined, dangers of, 171–5
 training, 44
- mother–child relationship, 145. *see also*
 children, maternal killing of;
 “schizophrenogenic mother”
- motivation
 brain areas associated with, 93
 and evolution, 137
 for lying, example of, 136
- motor release phenomena, 70, 166
- MRI. *see* magnetic resonance imaging
- murders
 by Ricky Green, 49–54
 by schizophrenics, 148
- naltrexone, 140
- natural law, concept of, 21–2
- nature vs. nurture, 20–1
 moral development and, 81–3, 192n.40
 in Ricky Green's case history, 61–3, 66, 67–8
 Wilson's arguments supporting, 23–4
- negative reinforcement. *see* losses
- neurochemicals
 attachment and, 112
 sexual dysfunction and, 110
 of social bonding, 105
- neuroimaging, 32–3, 182n.18. *see also*
 specific imaging methods
 brain injuries, 74
 dopamine D2 receptors, 140–1
 legally admissible evidence provided by, 152–3
- neurons
 mapping in brain, 27
 mirror, 40–1, 185n.32
 in primate brain, 184n.19, 204n.39
- neuropathology, “free will” and, 69–70
- neuropeptide levels, during sexual arousal
 and orgasm, 105–6
- neuroplasticity, 42–5, 163
 genetic engineering and, 168
 in stroke victims, 44
- neuroscience
 dangers inherent in, 174
 future directions for, 164–5, 174–5
- neurosilicon hybrid implants, 169
- neurotransmitters, 64, 103, 154
- New Testament, social morality and, 2, 3
- norepinephrine, 103
 in paraphiliacs, 110
- nucleus accumbens, 103, 111, 133
- obesity, gluttony and, 9–10
- obsessive–compulsive disorder, 137
- occipital association area, 39
- “old brain.” *see* hypothalamus
- Old Testament, social morality and, 2, 3, 175
- omission, “white lie” by, 117
- orbitofrontal cortex, 67
 dopamine receptors in, 134
 injuries to, behavioral sequelae of, 78–80
 neuronal activity in, 204n.39
 social awareness and, 93
- orbitofrontal gyrus (OFG), 94
- orgasm, 102
 neuropeptide levels during, 105–6
- oxytocin levels, during sexual arousal and
 orgasm, 105–6
- paradigm shifts, in thinking, 69, 189n.1
- paraphilias, 110
- parent–child relationship, 18–19. *see also*
 mother–child relationship
- parietal association area, 38–9
- parietal lobe
 inferior rostral, 40
 sexual arousal and, 101
- Patterson, Penny, 120
- Pavlovian experiments, 134
- P300 brain wave pattern, 122
- pedophilia, 110
- perfection, obstacles to. *see* Seven Deadly Sins
- perirhinal cortex, 202n.9
- PET. *see* positron emission tomography
- “phantoms,” moral thoughts as, 22
- pheromones, responses to, 109
- phrenology, 155
- physical abuse, 54–5, 63
- physical danger, response to, 125
- physicalism, 21–4
 attachment theories and, 19
 mentalism vs., 12, 20

Index

- Piaget, Jean, 16, 114–15
 developmental stages, 178n.6
 research limitations, 20
 Pinker, Stephen, 82
 Plato, 145
 Platt, Michael, 27, 70–1, 167
 polygraph testing, 121
 positive reinforcement. *see* gains
 positron emission tomography (PET), 10, 32
 brain studies using, 152–3
 ejaculation studies, 101
 violent offenders, 66
 postconventional level, of moral development, 16, 165
 posterior cingulate gyrus, 132
 postpartum depression, 149–50
 Potenza, Marc, 140
 power, uncontrolled, 136–7
 prairie vole, sexual behavior of, 103
 neuropeptide hormones and, 106
 preconventional level, of moral development, 16
 in brain-injured patients, 80
 precuneus, sexual arousal and, 101
 prefrontal cortex, 38–40
 activity during moral dilemma, 42
 dorsolateral area, 130
 “fight or flight” reaction and, 132
 injuries to, behavioral sequelae of, 67, 78–80, 128–9, 130, 153, 202n.14
 lying and, 121
 monetary decisions and, 127–8
 sexual arousal and, 101
 social awareness and, 93
 premotor cortex, 98
 activity during moral dilemma, 42
 lying and, 121
 pretense, lying and, 117–18
Pride and Prejudice (Austen), 4
 primates
 evolution of morality in, 8–9
 fairness and equality in, 80–1
 gender roles in, 89
 lying in, 120
 neurons in, 184n.19, 204n.39
 probability of gain, brain activity and, 27
 protection, bonding and, 18
 protesters, during Vietnam War, 17
psyche, 144
 psychiatric illness
 brain biology and, 13
 moral choices and, 13–14
 psychoanalysis, 22, 145
 psychological abuse, 57
 psychopaths, 46
 attributes of, 47–8
 institutional behavior of, 48
 intelligence of, 48
 obsessive, case example, 46–61
 psychosurgery, 173
 psychotic symptoms, 149
 puberty, 110
 reversed gender identity at, 90
 testosterone release at, 91
 punishment-avoidant technique, lying as, 115
 putamen, 98, 101, 131
 Quartz, Steven, and Terrence Sejnowski, *Liars, Lovers, and Heroes*, 24
 Raine, Adrian, 152–3
 rape, 56
 rats, sexual arousal studies in, 98
 readiness potential, measuring, 26, 70
 “reciprocal altruism,” 8
 religion, concepts of good and evil and, 2
 remorse, 48–9, 79
 repression, Freud on, 22
 responsibility
 gambling and, 141–2
 mental illness and, 160, 178n.3
 reward. *see* gains
 rewiring. *see* neuroplasticity
 right and wrong
 cultural concepts of, 2
 de Waal on, 8
 discriminating between, 150, 156
 historic views of, 144
 learning about, 13–14
 Ritalin, 172
 rodents. *see* prairie vole; rats
 romantic love
 attachment and, 104–5
 caudate nucleus and, 181n.15
 deception in, 118–19
The Sacred Disease (Hippocrates), 12
 Sanders, Lawrence, 4
 Sartre, Jean-Paul, 22
 schizophrenia, 146–7
 genetic studies in, 147
 homicides and, 148
 violent crimes and, 147
 “schizophrenogenic mother,” 145, 206n.8
 scientific method, 21–2
 selection mechanism, moral development and, 81–3
 selective serotonin reuptake inhibitors (SSRIs), 110
 self-awareness, Socratic principle of, 2–3
 self-interest
 lying and, 118
 moral choice and, 14
 self-preservation/-protection. *see* lying

Index

- sensorimotor cortex, 98
 sensory–motor connection, 27
 sequential information, mirror-neuron system and, 40–1
 serotonin, 64, 110, 127
 function, in pathological gamblers, 139
 Seven Deadly Sins, 3, 175
 as anchor for evil, 4–5
 biological factors affecting, 4–5, 9–11
 “free will” and, 9–10, 11
 literary characters based on, 4
 sex, as trigger for violence, 49–54
 sexual abuse, 54–5, 63
 sexual addiction, 101
 sexual arousal
 brain structures involved in, 97–8
 gender differences in, 97, 102
 neurochemicals and, 98–9
 neuroimaging studies, 101
 neuropeptide levels during, 105–6
 testosterone and, 111
 sexual behavior
 morality of, 111–13
 obsessive, case example, 84–6, 91–3, 95–6, 99–100, 106–7
 testosterone and, 10–11
 sexual domination, 57
 sexual dysfunction, medications causing, 110
 sexuality, deviant, 19
 sexual orientation/preferences, 107–11
 biology of, 108, 199n.58
 sexual psychopath, 174
 shame, 7
 sign language, in apes, 120
Silence of the Lambs (movie), 47
 sin, and human emotions, 5–6
 single-photon emission computed tomography (SPECT), 32
 skin conductance responses, 129
 Skinner, B. F., 23
 sloth, depression and, 10
 Smith, Adam, 21
 Smith, Susan, 151
 sociability, bonding and, 18
 social awareness, neurobiology of, 93
 social cohesiveness, 94
 social control, manipulating brain biology for, 173, 174
 social instincts, in animals, 7–8
 social interactions
 mirror-neuron system and, 40–1
 ventral striatum and, 103–4
 social morality
 evolutionary and biological thesis of, 7–8
 foundations of, 2
Sociobiology (Wilson), 23–4
 sociopath, 46
 Socrates, self-awareness principle of, 2–3
 somatic marker hypothesis, 77, 112, 165
 somatic markers, 72, 77
 somatosensory cortices, social awareness and, 93
 Sondheim, Stephen, and George Furth, *Getting Away with Murder*, 4
 Spenser, Edmund, *The Faerie Queene*, 4
 Spock, Benjamin, 15
 SSRIs. *see* selective serotonin reuptake inhibitors
 staging concept, of moral development, 16–17
 stem cells, 168
 steroid hormones, in sexual arousal, 98
 Stewart, Martha, 136
 stored representations, 26, 27, 28, 36, 166–7
 case example of, 28–9
 stroke victims, therapeutic approaches to, 44
 subparafascicular nucleus, 101
 “Superego,” Freudian concept, 22, 180n.27
 superior temporal gyrus, left, language development and, 82
 superior temporal sulcus (STS), 41, 94
 survival, bonding and, 18
 sympathy, 41
 synchronization, of brain activity, 72
 systemizing, 87–8
 males and, 88, 194n.22
 Taub, Edward, 44
 Taylor, Pamela, 148
 template, brain as, 29
 temporal lobe, social awareness and, 93
 Ten Commandments, 4
 testosterone, 10–11
 aggressive behavior and, 91
 amygdala and, 100–1
 animal studies on, 111
 in brain, gender differences and, 89, 91, 194n.22
 neuropeptide hormones and, 106
 prenatal levels, sexual orientation and, 109
 puberty and, 91
 sexual arousal and, 111
 thalamus
 dorsomedial nucleus, 38
 medial ventral, 101
 theory of mind capacity, 93
 thermal testing, 121
 thinking, paradigm shifts in, 69, 189n.1
 threat-response system, 65
 transcranial magnetic stimulation (TMS), 168

Index

- transformational grammar, 29, 82
- transplantation, of brain parts, 169
- transporter gene, 64
- truthfulness, tests for. *see* lie detection
- twin studies, of schizophrenia, 146
- Tyco International, 136
- unconscious processes. *see* stored representations
- unpredictability, dopamine system responses and, 135
- uploading information, to brain, 170
- utilization behavior, 70
- Valenstein, Elliott, *Great and Desperate Cures*, 173
- vasopressin, during sexual arousal and orgasm, 105–6
- venlafaxine therapy, in stroke victims, 44
- ventral striatum, social interaction and, 103–4
- ventral tegmental area (VTA), 101, 111
- verbal therapy, in stroke victims, 44
- Vietnam War, protesters during, 17
- violence
 - biosocial model of, 152
 - MAO-A and, 154, 164
 - mental disorders and, 147
 - sex and alcohol triggering, 49–54
- virilization, genital, 90
- visual system, amygdala and, 101
- vole. *see* prairie vole
- Volkow, Nora, 140
- war, deception in, 118
- Watson, John B., 22–3
- Wegner, Daniel M., *The Illusion of Conscious Will*, 71–2
- Weisel, Thorsten, 43
- Wernicke, Carl, and Wernicke's area, 82
- white-collar criminals, characteristics of, 136–7
- “white lies,” 116, 117
- Williams syndrome, 29, 181n.15
 - characteristics of, 30–1
- Wilson, E. O., *Sociobiology*, 23–4
- Woolf, Virginia, 174
- wrath. *see* anger
- wrong. *see* right and wrong
- Yates, Andrea, 149–51
- Yerkes National Primate Center, 80
- Zeki, Semir, 104–5