## Index

<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>abnormal dominance</td>
<td>200</td>
</tr>
<tr>
<td>acetylcholine 78–79</td>
<td></td>
</tr>
<tr>
<td>ADHD see attention deficit/hyperactivity disorder</td>
<td>24, 26–27, 30, 107–108</td>
</tr>
<tr>
<td>auditory cortex</td>
<td></td>
</tr>
<tr>
<td>ADHD see attention deficit/hyperactivity disorder</td>
<td>24, 26–27, 30, 107–108</td>
</tr>
<tr>
<td>attention deficit/hyperactivity disorder</td>
<td></td>
</tr>
<tr>
<td>auditory cortex</td>
<td></td>
</tr>
<tr>
<td>brain anatomy 44, 69–70</td>
<td></td>
</tr>
<tr>
<td>interactive specialization view 230–231</td>
<td></td>
</tr>
<tr>
<td>language 167</td>
<td></td>
</tr>
<tr>
<td>autism</td>
<td></td>
</tr>
<tr>
<td>brain anatomy 61</td>
<td></td>
</tr>
<tr>
<td>cerebral lateralization 200</td>
<td></td>
</tr>
<tr>
<td>genes and genetics 38–39</td>
<td></td>
</tr>
<tr>
<td>methods and populations 18, 24–25, 27, 29–30</td>
<td></td>
</tr>
<tr>
<td>social brain 121, 146–151</td>
<td></td>
</tr>
<tr>
<td>vision 107–108</td>
<td></td>
</tr>
<tr>
<td>American Sign Language (ASL) 173–174</td>
<td></td>
</tr>
<tr>
<td>amnesic syndrome 156</td>
<td></td>
</tr>
<tr>
<td>amygdala</td>
<td></td>
</tr>
<tr>
<td>brain anatomy 75–76</td>
<td></td>
</tr>
<tr>
<td>decision-making 190–191</td>
<td></td>
</tr>
<tr>
<td>interactive specialization view 238</td>
<td></td>
</tr>
<tr>
<td>social brain 122, 145</td>
<td></td>
</tr>
<tr>
<td>animal models</td>
<td></td>
</tr>
<tr>
<td>brain anatomy 62–65, 68–69</td>
<td></td>
</tr>
<tr>
<td>genes and genetics 32, 36, 40</td>
<td></td>
</tr>
<tr>
<td>language 168</td>
<td></td>
</tr>
<tr>
<td>long-term memory 156</td>
<td></td>
</tr>
<tr>
<td>methods and populations 23–24</td>
<td></td>
</tr>
<tr>
<td>social brain 128–131, 133, 138</td>
<td></td>
</tr>
<tr>
<td>ANS see approximate number system</td>
<td></td>
</tr>
<tr>
<td>anterior commissure 171</td>
<td></td>
</tr>
<tr>
<td>anticipatory tracking 94–95</td>
<td></td>
</tr>
<tr>
<td>antisaccade task 94–95</td>
<td></td>
</tr>
<tr>
<td>approximate number system (ANS) 206–209</td>
<td></td>
</tr>
<tr>
<td>artificial neural networks 233, 240, 242–243</td>
<td></td>
</tr>
<tr>
<td>ASL see American Sign Language</td>
<td></td>
</tr>
<tr>
<td>attention</td>
<td></td>
</tr>
<tr>
<td>social brain 124–128, 130, 139–143, 149</td>
<td></td>
</tr>
<tr>
<td>vision 83, 85, 90–96, 101–109</td>
<td></td>
</tr>
</tbody>
</table>

development 43–67
differential development of human cortex 71–74
differentiation 49, 59–60, 62–67
gray and white matter 51–52, 57–58, 74–75
hippocampus and subcortical structures 76–77
human brain anatomy 80–81
infancy and childhood 71–74
laminar structure of cortex 46–47
migration of neurons 50, 61–62
myelination 52–55, 57–58, 72, 74–75
neural networks 50–51, 56–58
neural tube 47–49
neuroimaging 50–51, 55, 57–58
neurons and glial cells 44–46, 49–52, 60–62, 77
neurotransmitters and neuromodulators 43, 57, 64, 77–80
overview of primate brain anatomy 44–47
plasticity 43, 55–56, 68–71
postnatal development 51–82
prenatal brain development 47–51
proliferative zones 49–50, 60–62
protomap hypothesis and protocortex hypothesis 43, 58–67
pyramidal cells 46, 61–62, 66, 77–78
Rakic’s radial unit model 60–62
regressive events 55–56
synaptic density 52, 55–56, 72
brain-cognitive mapping 223–224
brain damage
hierarchical organization 11
language 166–167, 169–172
long-term memory 160–161
neuroconstructivism 244
prefrontal cortex 185–186, 191–194
brain imaging studies see neuroimaging
Broca’s aphasia 167, 171
Bronson, Gordon 90
cerebellum
brain anatomy 44, 49, 77
developmental disorders 25, 26–28
long-term memory 163
methods and populations 25–28
social brain 147, 149–150
cerebral lateralization 197–204
biased brain models 197–202
biased gene models 197–199
biased head/uterus models 197–198, 202
concepts and definitions 197
hemispheric specialization 197–198, 202–204
language 171–172, 199, 200–203
right shift theory 198–199
social brain 200, 202–204
chreods 12–13
cognitive memory 156
cognitive neuroscience
concepts and definitions 1–2
constructivism 6, 13–14
development 1, 9–11, 13–14
object perception 110, 114–116
see also interactive specialization view; maturational view; skill learning view
cognitive tasks 18–19
color-processing 230
computed tomography (CT) 217
conditioned eye blink 163
congenital blindness 151
congenital deafness 166, 173–174
connectionist neural networks 8–9
Conspec face-biasing system 126–128, 133–134, 142
constructivism 1, 5–6, 11–14
cooperative concentration model 65
corpus callosum 171, 200–202
cortical development
brain anatomy 43, 44–47, 58–74, 80–81
prefrontal cortex 183–196
social brain 131–138
cortical matrix models 233–234
Crick, Francis 33
cross-fostering studies 36
cross-modal integration 230–232
cross-model plasticity 69
CT see computed tomography
callosal agenesis 201–202
Cambridge Neuropsychological Testing Automated Battery (CANTAB) 187
cataracts 29
Index

Darwin, Charles 2
deafness 166, 173–174
decision-making 189–191
delayed response task 96–97
dendrites
  brain anatomy 46, 52–53, 62, 72
  interactive specialization view 228, 233
deoxyribonucleic acid (DNA) 33–35
development
  analyzing development 6–11
  brain anatomy 43–67
  cause of developmental change 11–13
  cognitive neuroscience 1, 9–11, 13–14
  concepts and definitions 1–2
  constructivism 1, 5–6, 11–14
  cortical development 43, 44–47, 58–74,
  80–81, 131–138, 183–196
  differential development of human cortex 71–74
  genes and genetics 38–39
  gene–environment interactions 7–8
  human brain anatomy 80–81
  innate and acquired components 6, 7
  integrated developmental cognitive neuroscience 241–243
  interactive specialization view 1, 14
  long-term memory 154–162, 164
  maturational view 1, 13–14
  nature–nurture debate 1, 2–5
  neurotransmitters and neuromodulators 43, 57, 64, 77–80
  object perception 110, 113–118
  phylogeny and ontogeny 2–6
  plasticity 43, 55–56, 68–71
  postnatal development 15, 51–82,
  131–138, 143–147, 225, 226–228
  predetermined and probabilistic epigenesis 11–12, 219, 222–223
  prefrontal cortex 183–196
  prenatal brain development 47–51
  saccade planning 99–102
  skill learning view 1, 14, 29
  social brain 131–138, 143–146
  vision 83–109
  visual attention 83, 102–109
  visual orienting 83, 89–102, 107
  vitalism, performanceism and spermism 3–5
see also developmental disorders;
  interactive specialization view;
  maturational view; skill learning view
developmental disorders 14–15
  educational neuroscience 205, 216–220
  genes and genetics 32, 38–39
  integrated developmental cognitive neuroscience 240, 244–245, 248–249
  language 166–167, 179–182
  methods and populations 18, 24–25, 26–30
  neuroconstructivism 244–245
  object perception 118
  social brain 121, 132, 137, 146–151
  vision 107–108, 118
differentiation 49, 59–60, 62–67
diffusion tensor imaging (DTI) 22
discriminative ability
  educational neuroscience 207–210,
  217–218
  language 177–178
  long-term memory 156
  social brain 138, 146
distal transfer 102
DLPC see dorsolateral prefrontal cortex
DNA see deoxyribonucleic acid
domain-general skills 205, 213–216
domain-specific knowledge 205–207
dopamine 37, 79, 107
dorsal sensorimotor action pathway 85, 110, 111–118
dorsolateral prefrontal cortex (DLPC) 94–96
Down's syndrome 24, 27, 148, 150
DTI see diffusion tensor imaging
dual route processing model 115–117
dyscalculia 205, 216–220
dyslexia 27, 38–39, 205, 216–220
economic deprivation 29, 248–249
educational neuroscience 205–220
  concepts and definitions 205–207
  developmental disorders 205–207
  discriminative ability 207–210, 217–218
  domain-general skills 205, 213–216
  domain-specific knowledge 205–207
dyscalculia and dyslexia 205, 216–220
  executive functions and processing speed 205, 213–216
integrated developmental cognitive neuroscience 249
literacy 205–207, 211–220
numeracy 205–211, 213–220
working memory 205, 214–216
EEG see electroencephalography
egocentric saccades 100–101, 112
electroencephalography (EEG)
methods and populations 20
object perception 118–119
prefrontal cortex 186, 188–189, 192–194
social brain 142, 145
embodied cognition 125–126
emergent modularity 229–233
emotions 132, 183
environmental deprivation 28–29, 248–249
epigenesis
epigenetic landscape 12–13, 30, 245
epigenome 40–41
genes and genetics 32, 36–41
predetermined epigenesis 11–12
probabilistic epigenesis 11–12, 219, 222–223
episodic memory 153–154, 158–161
ERP see event-related potentials
ethology 128, 243
event-related potentials (ERP)
cerebral lateralization 200
educational neuroscience 209, 212
interactive specialization view 225–226
language 166, 172–173, 175–178
long-term memory 164
prefrontal cortex 192
social brain 135–136, 141–142, 149
vision 87, 98–99, 105–106
evolution 3
executive functions 205, 213–216
experience-dependent/expectant
information storage 7–8
explicit memory 153–154, 155–162
eye trackers 19, 101–102
face-biasing system 126–128, 133–134, 142
face recognition 123–128
brain development 131–138
cerebral lateralization 202–204
complex face representations in newborns 126
concepts and definitions 121, 123–124
developmental disorders 150
face-biasing system 126–128, 133–134, 142
sensory hypothesis 125–126
false-belief task 148
familial risk factors 30
febrile seizures 157
feedback 238
FFA see fusiform face area
FG see fusiform gyrus
filial imprinting 128–131
fixation duration 93, 101, 106
fMRI see functional magnetic resonance imaging
FOXp2 gene 32, 41–42, 168, 179–180
fragile-X syndrome 24, 27, 38–39
Franklin, Rosalind 33
frontal cortex 122–123, 149
frontal eye fields (FEF) 91–99
functional magnetic resonance imaging (fMRI)
brain anatomy 50–51, 55, 58, 75
cerebral lateralization 201, 204
educational neuroscience 209–210, 212, 215–216
genes and genetics 38
interactive specialization view 223, 225–226, 235–236
language 173–174, 176–177, 180
long-term memory 159
methods and populations 20–21
prefrontal cortex 187, 191
social brain 136–137, 142–146
vision 85–86, 99
fusiform face area (FFA) 122, 132, 136–137, 143
fusiform gyrus (FG) 145
gamma-aminobutyric acid (GABA) 57, 78
gaze contingency 19, 102
GBG see Geschwind, Behan, and Galaburda
genes and genetics 32–42
animal models 32, 36, 40
cerebral lateralization 197–199
concepts and definitions 32
developmental cognitive neuroscience 36–40
developmental disorders 32, 38–39
epigenesis 32, 36–40
genes and genetics (cont’d)
  epigenome 40–41
  FOXP2 gene 32, 41–42
  gene–environment interactions 7–8
  historical development 33
  integrated developmental cognitive neuroscience 240, 241
  language 179–180
  methods and populations 23–24
  pleiotropy 35, 42
  population studies 32, 38–39
  principles of gene function 34–36
  products of gene expression 32, 36–37
  variability 32, 37
  vision 106–107

Geschwind, Behan, and Galaburda (GBG) model 199–200

glial cells 44–46, 49–50, 60–62
glioblasts 49
glucose uptake 56
glutamate 77–78
Golgi stain 22, 53
grammar 41–42, 168, 174, 179–180
graph theory 234–235
gray matter 51–52, 74–75, 187

habit systems 156
habituation 19
handedness 198–199
HD-ERP see high-density event-related potentials
Hebbian learning 8, 228, 233, 236
hemispheric specialization 197–198, 202–204
Heschl’s gyrus 167
hidden objects 114–118, 185
hierarchical organization 11, 191, 237–239
high-density event-related potentials (HD-ERP) 20

hippocampus
  brain anatomy 76–78
  interactive specialization view 232, 238
  social brain 138
  working memory 185–186, 188–189
human functional brain development see interactive specialization view; maturational view; skill learning view

hydrocephalus 150
hyperdimensional plaid view 64–65
hypothalamus 48–49

IMM see intermediate and medial part of the mesopallium
immediate early genes 40
implicit memory 153–154, 162–164
individual-specific environments 7–8
inferior temporofrontal loop 167
information storage 7–8
inheritance 33
inhibition 213
inhibition of return 103
innate representations
  brain anatomy 60
development 9
  language 168–169, 181
  prefrontal cortex 195
  social brain 128

integrated developmental cognitive neuroscience 240–250
  applications of developmental cognitive neuroscience 248–249
  brain structure and function in development 241–243
  concepts and definitions 240–241
  criticisms of developmental cognitive neuroscience 245–247
  developmental disorders 240, 244–245, 248–249
  educational neuroscience 249
genes and genetics 240, 241
  neural networks 240, 242–243
  neuroconstructivism 243–245
intelligent quotient (IQ) 58, 179–180
inter/interregional connectivity 223–224

interactional specialization view 221–239
  brain-cognitive mapping 223–224
  concepts and definitions 1, 14, 221–225
cortical matrix models 233–234
cross-modal integration 230–232
dropout emerging networks 233–238
graph theory 234–235
hierarchical networks 237–239
language 172, 181
localization 225–226
long-range connectivity 234–237
long-term memory 160
neuroconstructivism 243–245
object perception 114
parcellation and emergent modularity 229–235
plasticity 223, 224–225
selective pruning 226–228
top-down feedback 238
vision 91–92, 99, 114
working memory 188, 191–194
inter/intrahemispheric language reorganization 171–172
inter/intraregional connectivity 223–224
intermediate and medial part of the mesopallium (IMM) 128–131
interrupted stimulus method 104–105
intersensory competition 172–173
interstimulus interval (ISI) 94
intraparietal sulcus (IPS) 211
Iowa Gambling Task 189–190
IPS see intraparietal sulcus
IQ see intelligence quotient
ISI see interstimulus interval
item memory 159–160
Johannsen, Wilhelm 33
joint attention 139–143
Kanisza figure stimulus 118–119
knowledge-based cascade correlation 237
language 166–182
brain damage 166–167, 169–172
cerebral lateralization 171–172, 199, 200–203
concepts and definitions 166–169
cortical structures and language acquisition 168–174
developmental disorders 166–167, 179–182
discriminative ability 177–178
educational neuroscience 211–213, 214
event-related potentials 166, 172–173, 175–178
experience and brain language processing 177–178
genes and genetics 179–180
grammar 168, 174, 179–180
human functional brain development 172, 181
innate representations 168–169, 181
interactive specialization view 232
interhemispheric language reorganization 171–172
learning 178
neural basis of speech processing in infants 168–169, 175–177
neural correlates of typical and atypical acquisition 178–181
primary and secondary functions 167–168
prospective studies 170
vocabulary 178–179, 181
lateral geniculate nucleus (LGN) 44, 62–63, 69–70, 86, 88–91
lateral temporal complex (LTC) 145
LCMRGlc see local cerebral metabolic rates for glucose
learning development 7–8
domain-general skills 205, 213–216
domain-specific knowledge 205–207
dyscalculia and dyslexia 205, 216–220
educational neuroscience 205–220
executive functions and processing speed 205, 213–216
Hebbian learning 8, 228, 233, 236
interactive specialization view 228, 233, 236
language 178
literacy 205–207, 211–220
long-term memory 153–165
numeracy 205–211, 213–220
social brain 128
working memory 205, 214–216
LGN see lateral geniculate nucleus
limbic system 76–77
literacy 205–207, 211–220
local cerebral metabolic rates for glucose (LCMRGlc) 73
Index

localization 225–226
long-range connectivity 234–237
long-term memory 153–165
cognitive memory and habit systems 156
concepts and definitions 153–155
developmental cognitive neuroscience 154–155
 episodic memory 153–154, 158–161
 explicit memory 153–154, 155–162
 human functional brain development 156–158, 160
 implicit memory 153–154, 162–164
 multisystem view of memory 154, 158
 perceptual priming 154, 162, 164
 semantic memory 153–154, 160
 LTC see lateral temporal complex

magnetic resonance imaging (MRI)
 brain anatomy 50–51, 55, 57–58, 74–76
 cerebral lateralization 201, 204
 educational neuroscience 209–210, 212, 215–217
 genes and genetics 38
 interactive specialization view 223, 225–226, 235–236
 language 173–174, 176–177, 180
 long-term memory 159
 methods and populations 20–21, 22, 28
 prefrontal cortex 187, 191
 social brain 136–137, 142–146
 vision 85–86, 99
 Mareschal’s dual route processing model 115–117

marker tasks
 long-term memory 155
 methods and populations 19
 vision 83, 96–97, 101–102

masculinization of the brain 200

maturational view
 brain-cognitive mapping 223–224
 concepts and definitions 1, 13–14, 222–225
 long-range connectivity 236
 long-term memory 156–158, 160
 object perception 113
 plasticity 223, 224–225
 social brain 121, 123, 126, 131, 134–135, 138

 vision 91–92, 97, 113
 working memory 183, 186–191
 medial geniculate nucleus (MGN) 44, 69–70
 medial prefrontal cortex (MPFC) 145–146
 medial temporal lobe (MTL) 90–91, 95–96, 137, 153–162, 164

 memory
 cognitive memory and habit systems 156
 concepts and definitions 153–155, 183
 educational neuroscience 205, 214–215
 episodic memory 153–154, 158–161
 explicit memory 153–154, 155–162
 implicit memory 153–154, 162–164
 multisystem view 154, 158
 perceptual priming 154, 162, 164
 prefrontal cortex 183–189
 semantic memory 153–154, 160
 working memory 183–189, 205, 214–216

Mendel, Georg 33

MGN see medial geniculate nucleus

mirror neuron system (MNS) 144–145

Morgan, T. H. 33

mosaic quilt view 64

motion-processing 230

MPFC see medial prefrontal cortex

MRI see magnetic resonance imaging

MTL see medial temporal lobe

multisystem view of memory 154, 158

mutual gaze 139–143

myelin 203

myelinated fiber bundles see white matter

myelination 52–55, 57–58, 72, 74–75, 236

naming explosion 178, 179

nature–nurture debate 1, 2–5

near infrared spectroscopy (NIRS)
 language 176–177
 methods and populations 21
 social brain 142–144
 vision 86

neocortex 43–49, 60–63, 76, 80

neural networks
 artificial neural networks 233, 240, 242–243
 brain anatomy 50–51, 56–58
 concepts and definitions 1
 interactive specialization view 237
plasticity 8–9
social brain 126–127
working memory 183, 191
neural oscillations 118–119
neural tube 47–49
neuroblasts 49
neuroconstructivism 243–245
neuroimaging
  brain anatomy 50–51, 55, 57–58, 74–76
cerebral lateralization 201, 204
developmental disorders 15, 25, 28
educational neuroscience 209–210, 212, 215–217
integrated developmental cognitive neuroscience 245–246
interactive specialization view 223, 225–226
long-term memory 159, 162–163
methods and populations 18, 20–22, 28
object perception 113
prefrontal cortex 183, 187
social brain 132–133, 136–137, 140, 142–146
vision 85–86, 96, 99, 103
neuromodulators 43, 64, 77–80
neurons
  brain anatomy 44–46, 49–52, 60–62, 77
  interactive specialization view 227–228
language 167
object perception 112
vision 86–87
neuropsychology
  brain anatomy 60
cerebral lateralization 198
educational neuroscience 210
integrated developmental cognitive neuroscience 244–245
long-term memory 155
methods and populations 24
social brain 132, 134, 147, 149
vision 84, 90, 99
neurotransmitters
  brain anatomy 43, 57, 64, 77–80
genes and genetics 37
social brain 130
NIRS see near infrared spectroscopy
nonsymbolic representations 207–208, 210
norepinephrine 79, 130
numeracy 205–211, 213–220
object-file systems 207, 209–210
object perception 110–120
  concepts and definitions 110
developmental disorders 118
dorsal sensorimotor action pathway 110, 111–118
dual route processing model 115–117
hidden objects 114–118
human functional brain
development 113–114
neural oscillations and object processing 118–119
prefrontal cortex 184–189
spatial-temporal information 112–113
ventral recognition pathway 110, 111–118
object permanence 184–189
object recognition network 115–117
obligatory attention 93, 106
ocular dominance columns 86–89, 230
oculomotor control 90–97
ontogeny 2–6
orbitofrontal cortex 122
orienting 83, 89–102, 107
orphanages 29
orthographic familiarity effect 218
parcellation 229–235
parietal cortex
  educational neuroscience 211
  language 173, 178
  vision 94, 96, 99–100, 103
  working memory 187–188
partial deletion 39
passive cell displacement 50
perceptual priming 154, 162, 164
performationism 3–5
perinatal stroke 171
PET see positron emission tomography
PFC see prefrontal cortex
phenylketonuria (PKU) 24, 27, 37, 147
phonemes 217–218
phylogeny 2–6
Piaget, Jean 5–6, 114–115, 185–186
PKU see phenylketonuria
planum temporale 171, 217
plasticity
  brain anatomy 43, 55–56, 68–71
development 8–9
  genes and genetics 40, 42
  human functional brain
development 223, 224–225
language 172–173, 181
social brain 129, 131
pleiotropy 35, 42
positron emission tomography (PET)
  brain anatomy 55–56, 73
  educational neuroscience 217
  object perception 113
  prefrontal cortex 191
  social brain 136–137
vision 96, 99, 103
postnatal development
  brain anatomy 15, 51–82
  interactive specialization view 225, 226–228
  social brain 131–138, 143–147
Prader-Willi syndrome 24, 27
predetermined epigenesis 11–12
predisposition 130–131
preexplicit memory 157
preferential looking 19
prefrontal cortex (PFC) 183–196
  brain anatomy 75–76
  brain damage 185–186, 191–194
  concepts and definitions 183–184
  decision-making 189–191
  electroencephalography 186, 188–189, 192–194
  integrated developmental cognitive neuroscience 241–242
  interactive specialization view 188, 191–194, 236–238
long-term memory 153–154, 159
maturational view 183, 186–191
object permanence 184–189
skill learning view 188, 191–194
social brain 123, 189–191
vision 94–96
working memory 183–189
prenatal development 15, 47–51
prerepresentations 227
presaccadic events 97–98
primal interactions 7–8
priming 154, 162, 164
probabilistic epigenesis 11–12, 219, 222–223
processing speed 205, 213–216
proliferative zones 49–50, 60–62
prosopagnosia 132, 137
proteins 33–35
protocortex hypothesis 43, 58–67
protomap hypothesis 43, 58–67
psychological development 3–6, 18
pulnivlar 132, 134
punishment 189–190
pyramidal cells 46, 61–62, 66, 77–78
radial unit model 60–62
Rakic’s radial unit model 60–62
reaction time 162–163
regressive events 55–56
regulatory development 224
retinocentric saccades 100–101
reward 189–190
ribonucleic acid (RNA) 34
right shift theory 198–199
RNA see ribonucleic acid
saccades 89–91, 94–102, 104–105, 111–112
schizophrenia 61, 147
segregation 229–235
selective pruning 226–228
semantic memory 153–154, 160
sensory deprivation 28–29, 248–249
sensory hypothesis 125–126
serotonin 57, 79, 107
sign language 173–174
SIPN see Social Information Processing Network
skill learning view
  brain-cognitive mapping 223–224
  concepts and definitions 1, 14, 222–225
  methods and populations 29
  object perception 113–114
  plasticity 223, 224–225
  social brain 121, 123, 127, 131, 135, 138
vision 91–92, 97–99, 113–114
working memory 188, 191–194
small world networks 234–235
SOA see stimulus onset asynchrony
social brain 121–152
brain development and face recognition 131–138
cerebral lateralization 200, 202–204
complex face representations in newborns 126
decision-making 189–191
developmental disorders 121, 132, 137, 146–151
face-biasing system 126–128, 133–134, 142
face recognition 121, 123–128, 131–138, 150, 202–204
filial imprinting 128–131
joint attention and mutual gaze 139–143
neuroimaging 132–133, 136–137, 140, 142–146
perceiving and acting on the eyes 139–143
prefrontal cortex 189–191
sensory hypothesis 125–126
understanding and predicting others’ behavior 143–146
social deprivation 29, 248–249
Social Information Processing Network (SIPN) model 189
soft soak 56–57, 77
somatosensory cortex 66–67, 70–71, 230
source memory 159
SP see spike potential
spatial cueing paradigm 105–107, 139–143
spatial-temporal information 112–113
species-typical environments 7–8
specific language impairment 27
spermism 3–4
spike potential (SP) 97–98
spontaneous action 157–158
stereoacuity 87
sticky fixation 93, 106
stimulus onset asynchrony (SOA) 103–104
stroke 171–172
structure–function relations 224
STS see superior temporal sulcus
subcortical structures
brain anatomy 76–77
long-term memory 164
social brain 132–134
vision 89, 91–93
substantia nigra 91
subventricular zone 49
superior colliculus 91, 94, 96, 131–132, 134, 232
superior temporal sulcus (STS) 122, 132, 139–140, 143
sustained attention 104–105, 108
symbolic representations 207–208, 210
synaptic density
brain anatomy 52, 55–56, 72
interactive specialization view 226–228
language 179
temporal cortex 178
testosterone 75, 130, 200
thalamus 44, 48–50, 62–71, 73, 76–77, 82
top-down feedback 238
theory of mind 122–123, 145, 147–149
trajectory prediction network 115–117
transformation-invariant representation 112
turner syndrome 27

vector summation saccades 100–101
ventral recognition pathway 85, 110, 111–118
ventricular zone 49
verbal working memory 214
view-centered representation 112
vision 83–109
attention 83, 85, 90–96, 101–109, 124–128, 130, 139–143, 149
cerebral lateralization 202–204
cerebral lateralization 202–204
concepts and definitions 83
dorsal sensorimotor action pathway 85, 110, 111–118
educational neuroscience 209–211, 214–215
face recognition 121, 123–128, 131–138, 150, 202–204
filial imprinting 128–131
Index

vision (cont’d)
  fixation duration  93, 101, 106
  frontal eye fields  91–99
  genes and genetics  106–107
  hidden objects  114–118
  human functional brain
    development  91–92, 96–99, 113–114
    interactive specialization view  230
  long-term memory  156–157, 163–164
  marker tasks  83, 96–97, 101–102
  object perception  110–120
  oculomotor control  90–97
  orienting  83, 89–102, 107
  perceiving and acting on the eyes  139–143
  refinement by selective loss  87–89
  saccades and saccade planning  89–91, 94–102, 104–105, 111–112
  segregation of visual information  83, 87–88, 112, 117
  social brain  121, 123–128, 130–143, 149–151
  spatial cueing paradigm  105–107
  spatial-temporal information  112–113
  stereoaucity  87
  stimulus onset asynchrony  103–104
  tracking  91, 93–96, 101–102, 109, 112–113, 124–125
  ventral recognition pathway  85, 110, 111–118
  visual cortex  44, 62–63, 69–70, 83–84, 86–95
  visual expectancies paradigm  163
  visual word form area (VWFA)  212, 215, 218
  visuospatial working memory  214–215
  vitalism  3–5
  vocabulary  178–179, 181
  VWFA see visual word form area

Waddington, C. H.  12–13, 30
Watson, James  33
weight-adjustment learning  8
Wernicke’s aphasia  167, 171
white matter  51–52, 57–58, 74–75, 187–188
Wilkins, Maurice  33
Williams syndrome (WS)
  genes and genetics  38–39
  language  180–181
  methods and populations  18, 24–25, 27–28
  object perception  118
  social brain  121, 146, 150
  working memory  183–189, 205, 214–216
WS see Williams syndrome