

Index

- 1-back task, 66–67
10,000-hour rule, 245
10-year rule, 245
- abacus
calculation studies, 126–135
definition of, 121
- Abernethy, B., 202, 212, 215–217
- Abreu, A.-M., 213–214
- absolute pitch
anatomy of, 80–82
neurology of, 77–82
- action observation network (AON)
and deception, 217–220
and mirror neurons, 209–211
and temporal occlusion, 215–217
in motor expertise, 25–27
in sports, 212–215
- adaptability
and motor expertise, 170–171
in brain functioning, 16–19
neurology, 183
- aging
and olfactory expertise, 93
functional changes with, 231–232
structural characteristics of, 232–234
- Aglioti, S., 204–207, 213–214
- Ali, Muhammad, 223–225
- Amedi, A., 84
- amygdala
and blindness, 92
and gustative expertise, 88
in olfactory system, 42
- analytical/structural processing, 46
- anatomy
changes in board games, 158–160
of absolute pitch, 80–82
of motor system, 171–177
- angular gyrus (AG)
and abacus calculations, 131
and calculation expertise, 121–122
- anterior cingulate cortex (ACC), 218–219
- anterior cingulate gyrus (ACG), 125
- anticipation
and AON, 25–27
and mirror neurons, 208–209
and motor expertise, 197–205
and the action observation network, 212–215
neurology of, 215–217
- AON. *See* action observation network
- arcuate fasciculus (AF), 242
- auditory expertise
and absolute pitch neurology, 77–82
and tones, 82
- auditory system, 76
- autism, 54
- automaticity, 171
- Baduk, 158–159
- Baker, C., 59
- Balser, N., 214
- Bangert, M., 190
- Bartlett, J., 150, 152–154
- basal ganglia
and the action observation network, 213
in motor system, 175, 176
- Bilalić, M., 11, 27, 30, 66, 70, 149–151, 154, 236–237
- Binet, A., 107, 110
- blindness
and brain plasticity, 42–45
and olfactory expertise, 91–92
and tactile expertise, 83–85
tactile ability and, 238–240
- board game expertise
chess studies and, 136–139
knowledge structures in, 139–141
memory and problem solving and, 141–144
neurology of, 145–160

- board game expertise (cont.)
 - problem solving in, 154–158
 - theories of, 144–145
- bottom-up processing
 - and visual expertise, 59–60
 - definition of, 36
- Braille
 - and brain plasticity, 43–45
 - and tactile expertise, 238–239
 - gray matter changes in, 186
- brain functioning
 - and plasticity, 16–19
 - development of, 19–21
 - neuroimaging techniques in, 15–16
- brain plasticity
 - and adaptability, 42–45
 - definition of, 16–19
 - in the motor system, 177
- Broca region
 - and abacus calculations, 132, 135
 - and language, 103, 104
- Brochet, F., 86
- Brown, Jim, 223–225, 226
- Bryan, W. L., 193–195
- Buschhäuser, D., 93
- Busey, T., 72–74
- calculation expertise
 - abacus calculators and, 126–135
 - everyday expertise in, 120–122
 - mental calculations and, 122–126
- Calvo-Merino, B., 209–211
- Campitelli, G., 150
- Cannonieri, G. C., 187
- Carey, S., 56
- Carlsen, Magnus, 225–226
- Carmody, D. P., 63–64
- Castriota-Scanderbeg, A., 87–88
- caudate nucleus (CaudNuc)
 - and sports deception, 219
 - in board game problem solving, 154–158
 - size of in board game play, 158–160
- central sulcus, 189–190
- cerebellum
 - and AON, 26–27
 - and expert memorizers, 115
- and motor expertise, 187
- in motor system, 175–176
- Chase, W., 110–111, 118, 139–141, 161–162, 245
- Chebat, D.-R., 239–240
- chess
 - and chunks, 139–142
 - and size of caudate nucleus, 159–160
 - hierarchical structure in, 162
 - holistic processing in, 151–154
 - intelligence in, 236–237
 - object recognition in, 146–148
- choline, 232
- chunking, 194
- chunking theory, 144–145, 194–195
- chunks
 - and holistic processing, 47
 - definition of, 10
 - in board game expertise, 139–142
 - motor programs as, 25
- cognitive expertise
 - chess as an example of, 8–12, 100–102
 - definition of, 5
- cognitive mechanisms
 - and LTM, 6
 - and spatial expertise, 161–162
 - expertise domains in, 5
 - expertise research and, 27–30
 - in motor expertise, 192–203
 - in radiological expertise, 62–65
 - motor domains in, 13–15
 - perception as, 7, 12
 - the same in different fields, 225–227
- Cohen, L. G., 44
- color center, 38
- composite face effect (CFE)
 - and board game expertise, 151–153
 - and Greebles, 57
 - and holistic processing, 48
 - and the FFA, 51–53
- concurrent task, 128
- condition, 145
- corpus callosum, 189
- cortical expansion, 179
- corticocortical connections, 44
- corticospinal tract, 173

Index

291

- creatine, 232
Cross, E.S., 212
dancing, 209–212
de Groot, A., 9–10, 27, 136–139
deception, 217–220
decision making, 197–201
declarative memory, 105
deliberate practice
 theory of, 243–246
 versus talent, 247–248
Desmurget, M., 174
Diamond, R., 56
diffusion tensor imaging (DTI)
 and adaptability, 183
 definition of, 16
digit span, 130
dopamine, 176
dorsal stream
 and musical notation, 76
 in auditory system, 40
 in visual system, 39
dorsolateral frontal cortex, 81
dorsolateral prefrontal cortex (DLPFC)
 and aging, 231
 and expert memorizers, 116, 117, 120
 and motor skill acquisition, 185
 and sports deception, 219
 and the neurology of sports anticipation, 217
 in board game problem solving, 154–157
dorsolateral prefrontal cortex (DLPFC)
 and auditory expertise, 82
 and gustative expertise, 87–91
 and tactile expertise, 83–85
double take of expertise, 227–229
Draganski, B., 186
ecological validity, 136
Einstellung mechanism, 10–13
electroencephalography (EEG)
 and abacus calculations, 133–134
 and face perception, 53–54
 and fingerprint expertise, 72–74
 and motor expertise viewing, 204
 and tactile expertise, 84–85
and the action observation network, 211–212
definition of, 16
electromyography (EMG), 178–179
Ellmore, T. M., 117
emotion, 117
Engel, S., 68–71, 243
Engvig, A., 232
environmentalist perspective, 247
environments
 and brain development, 18–19
 and expertise, 2–3, 236–237
episodic memory
 and calculation expertise, 124–125
 definition of, 105
Ericsson, A., 110–114, 116, 118, 243–246
everyday expertise, 5–6, 214–215
expert performance approach
 and expertise, 228
 and expertise research, 27–30
expertise
 and aging, 229–234
 brain accommodation in, 15–27
 cognitive mechanisms in, 5–15
 definition of, 2–5
 double take of, 227–229
 road to, 234–235
 transfer to new areas, 223–225
expertise approach
 and expertise, 229
 and memory training, 109
 in cognitive neuroscience, 27–30
 research in, 228–234
 skill acquisition, 4
expertise domains, 3
expertise hypothesis, 56–57
expertise research, 27–30
experts, 3
extrastriate cortex, 38–39
eye movement tracking, 200–201
face perception
 and the FFA, 57–58
 development of, 19–20
 holistic processing in, 46–48
 hypotheses of, 56–57

face perception (cont.)
 importance of in everyday life, 45
 individual differences in, 49–51
 neural implementation of, 51–56
 face specificity view, 28
 faces, 28–30
 face-specificity hypothesis, 56, 58
 FFA. *See* fusiform face area
 find the best solution task, 136
 fingerprint expertise, 71–74
 fMRI. *See* functional magnetic resonance imaging
 Fodor, J., 57
 Frasnelli, J., 93
 frontal pole (FP), 117
 functional connectivity, 185
 functional expansion
 and neural implementation, 21–27
 definition of, 19, 21
 of expert's brain activation, 22–23
 functional magnetic resonance imaging (fMRI)
 and abacus calculations, 133–135
 and auditory expertise, 79–80
 and expert memorizers, 114
 and motor expertise, 183–185
 and olfactory expertise, 92
 and the action observation network, 213–214
 definition of, 15
 of radiological expertise, 66–68
 functional neuroimaging techniques, 15–16
 functional reduction, 20–21
 functional reorganization, 19
 fusiform face area (FFA)
 and board game expertise, 152–154
 and face perception, 51–56
 and musical notation, 75
 and radiological expertise, 66, 69–71
 and the expertise approach, 28–30
 and visual expertise, 59–61
 as a brain module, 57–58
 fusiform gyri (FG)
 activation to cognitive stimuli, 21–23
 and aging, 232–234

and expert memorizers, 119–120
 and holistic processing, 152–154
 and olfactory expertise, 92
 and radiological expertise, 66, 70
 and tactile expertise, 84
 and visual expertise, 60
 and visual perception, 39
 development of, 19
 Gamm, R., 123–126
 gamma-aminobutyric acid (GABA), 183
 Gaser, C., 81
 Gauthier, I., 57, 74–76
 Gaye, Marvin, 77
 general expertise module, 28
 gestalt, 62
 gist, 62
 Gladwell, M., 245–246
 global processing
 and wine expertise, 88
 in radiological expertise, 62–65
 global-focal theory, 65
 Gobet, F., 11, 150, 236–237
 Goldstein, R., 87
 Gottfried, J., 92
 gray matter
 and aging, 229, 232–234
 and expert memorizers, 117
 and motor expertise, 186–187
 and olfaction, 94
 definition of, 16
 in Heschl's gyrus, 81
 Greebles, 57
 Grenouille, Jean-Baptiste (fictional character), 91, 94
 Gretzky, Wayne, 192–193
 Grey, Jennifer, 46–47
 Guardiola, Pep, 195
 gustative expertise, 85–91
 gustatory system
 anatomy of, 41–42
 in perceptual brain, 38
 gyrus rectus, 94
 half-move, 9
 Haller, S., 67

Index**293**

- Hampstead, B.M., 231–232
Hanakawa, T., 131–133, 135
Harel, A., 59–61
Harter, N., 193–195
Hatano, G., 128–129
Heschl's gyrus
 and auditory expertise, 81
 location of, 40
hierarchical structure, 161–162
hippocampus
 and aging, 231
 and blindness, 92
 and expert memorizers, 115, 120
 and expertise, 229
 and gustative expertise, 88
 and long-term memory, 104
 and spatial expertise, 162–165, 241
 in olfactory system, 42
holistic processing
 and board game expertise, 151–154
 and fingerprint expertise, 72–74
 and musical notation, 74–77
 and radiological expertise, 69–71
 hypotheses of, 56–57
 in face perception, 46–48
 in radiological expertise, 62–65
 N170 and FFA in, 51–56
Hu, Y., 116–117
Hyde, K. L., 242
- incidental recognition paradigm, 197
individual differences
 and practice, 234–235
 definition of, 234
inferior frontal cortex, 181
inferior frontal gyrus (IFG)
 and auditory expertise, 78
 and expert memorizers, 119–120
 and radiological expertise, 68
 and the action observation network, 214, 215
inferior frontal sulcus (IFS), 124–125
inferior parietal lobe (IPL)
 and abacus calculations, 131, 132, 135
 and aging, 231
 and auditory expertise, 80
 and expert memorizers, 118–120
 and sports deception, 219
inferior posterior lobe, 217
inferior temporal cortex, 39
inferior temporal gyrus (ITG), 124–125
inferotemporal cortex
 and radiological expertise, 68
 development of, 19
 in perceptual brain, 38
insula
 and olfactory expertise, 93
 and sports deception, 219
 and the action observation network, 213, 215
 in gustatory system, 41
interference design, 128
intermediate-term memory, 111–112
intraparietal sulcus (IPS)
 and abacus calculations, 132
 and calculation expertise, 121–122, 124–125
 and motor expertise, 186
 and musical notation, 76
 and tactile expertise, 85
 and the action observation network, 210, 214, 215
introspection, 137
inverted face effect (IFE)
 and face perception, 47–48
 and Greebles, 57
 and N170, 53–54
 and the FFA, 51–53
Jäncke, L., 159–160
Jordan, Michael, 170–171, 192
juggling, 186–187
Kalakoski, V., 162
Kalamangalam, G. P., 117
Kanwisher, N., 52
Karpov, Anatoly, 101, 105, 108
Keenan, J. P., 82

- kinematic information, 24–27
- Kintsch, W., 112–114
- Klein, M. E., 77, 82
- knowledge structures
 - and chunking, 194–195
 - and the occlusion paradigm, 203
 - and the road to expertise, 234–235
 - definition of, 10
 - in board game expertise, 139–144
- Kondo, Y., 118–120
- Kravitz, D., 59
- Krupinski, E., 64
- Kundel, H., 62
- Kupers, R., 92
- Landi, S. M., 182
- Langer, R., 154
- lateral occipital complex (LOC)
 - and radiological expertise, 69
 - and tactile expertise, 83–85
 - and visual expertise, 60
 - definition of, 39
- Lee, Y.-S., 82
- limbic system, 42
- lingual gyrus (LG), 119–120
- liquid-crystal occluding goggles, 199–200
- Liu, J., 50, 54–55
- longitudinal studies, 109–111
- long-term memory (LTM)
 - and calculation expertise, 124–126
 - and pattern recognition, 141–144
 - and the double take of expertise, 227
 - and the method of loci, 108–109
 - and working memory, 103–104
 - definition of, 6, 103
 - hierarchical structure of, 111–112
 - knowledge structures in, 10
 - longitudinal studies of, 110–111
 - of expert's brain activation, 23–24
 - pattern recognition in, 8
- long-term working memory (LT-WM)
 - theory, 112–114
- LTM. *See* long-term memory
- Lundström, P., 214
- Luria, A., 107, 110
- M1
 - anatomy of, 172–174
 - change in during skill acquisition, 178–183
- magnetic resonance imaging (MRI)
 - scanner, 178–183, 204
- magnetoencephalography (MEG)
 - and adaptability, 183
 - and musical expertise, 191
 - definition of, 15
- Maguire, E., 114–115, 117, 120, 162–165, 240–241
- McClure, S. M., 89
- McLeod, P., 11, 236–237
- meaningful encoding, 112
- medial frontal cortex (MFC), 125
- medial temporal cortex (MTC), 70
- memorizers
 - functional implementation of, 114–117
 - natural, 106–107
 - strategic, 107–109
 - structural characteristics of, 117–118
 - training studies, 118–120
- memory expertise
 - and long-term working memory, 112–114
 - and randomization, 196
 - memorizer types, 105–109
 - natural memorizers and, 106–107
 - neurology of, 114–118
 - skilled memory and, 111–112
 - training for, 109–111
- memory systems
 - and motor expertise, 195–197
 - neurology of, 102–105
- mental calculations, 23–24
- mental calculators, 122–126
- method of loci. *See also* visuo-spatial
 - imagery
 - and aging, 231, 232
 - and emotion, 117
 - and expert memorizers, 114–116, 119–120
 - definition of, 108–109
- middle frontal gyrus (MFG)
 - and calculation expertise, 124–125
 - and expert memorizers, 118–120

Index

295

- and sports deception, 219
and the neurology of sports anticipation, 217
middle temporal gyrus (MFG)
and motor expertise, 186
and tactile expertise, 86
and the action observation network, 215
and the neurology of sports anticipation, 217
in board game problem solving, 154–157
mild cognitive impairment, 231–232
mind/brain modules, 57–58
mind's ear, 79–80
mind's eye
and abacus calculations, 129–130
and expert memorizers, 120
and the method of loci, 109
definition of, 9
mirror neurons
and AON, 25–27
and measuring motor expertise, 25
and motor expertise, 207–209–212
science of, 208–209
mnemotechnics, 107–109, 118–120, 231
mnemonic strategies, 108
modules, 28
motion center (MT+), 38
motor expertise
anatomy of, 171–177
and functional adaptation, 170–171
and music, 188–192
as expertise domain, 13–15
cognitive mechanisms in, 192–203
definition of, 5
movement execution in, 14–15
neural implementation of, 24–27
neurology of, 204–220
studies of structural changes in, 186–187
motor imagery, 179–182
motor program
and motor expertise, 172
definition of, 25
motor system
adaptability of, 177–178
anatomy of, 171–177
skill acquisition in, 178–185
motor-evoked potential (MEP), 205–206
MT+, 38
Müller, Thomas, 192–193
multivariate voxel pattern analysis (MVPA), 66–67
muscle memory
and motor expertise, 171
definition of, 25
music motor expertise, 188–192, 241–243
musical notation expertise, 74–77
MVPA. *See* multivariate voxel pattern analysis
N170
and face perception, 53–56
and fingerprint expertise, 73–74
natural memorizers, 106–107
nature versus nurture, 238–243
neural scaffolding theory, 230
neurology
and olfactory expertise, 93–95
board game problem solving, 154–158
expertise the same in different fields, 225–227
in board game expertise, 145–160
memory systems, 102–105
nature versus nurture in, 238–243
of adaptability to new environments, 183
of anticipation in sports, 215–217
of deception in sports, 217–220
of face perception, 51–56
of memory expertise, 114–118
of motor expertise, 204–220
of radiological expertise, 65–71
of spatial expertise, 161–162
the FFA as a brain module, 57–58
neuropsychological approach, 30
neurotransmitter, 176
Neymar Jr., 28–29
Nodine, C., 62
non-declarative memory
and motor expertise, 172
definition of, 105
novices
and abacus calculations, 128–135
and board game expertise, 136–139

- novices (cont.)
 and global processing, 64
 and motor expertise, 204–205
 and object recognition, 146–148
 and radiological expertise, 67–68
 and the action observation network, 212
 as control in expertise research, 27–30
- numerical expertise. *See* calculation expertise
- Nyberg, L., 231
- Obama, Barack, 48
- object recognition, 146–148
- occipital cortex
 and expert memorizers, 120
 and olfactory expertise, 92
- occipital face area (OFA), 54
- occipital lobe
 and motor imagery, 181
 and radiological expertise, 68
 and tactile expertise, 86
 definition of, 37
 in perceptual brain, 38
- occipito-temporal junction (OTJ)
 and calculation expertise, 124–125
 and object recognition, 147–148
- occlusion paradigm
 and motor expertise, 13–14
 in motor expertise, 201–203
- olfactory bulb
 and olfactory expertise, 91–92, 93, 94
 in olfactory system, 42
- olfactory expertise, 91–95, 232–234
- olfactory sulcus, 94
- olfactory system anatomy, 41–42
- Olsson, C.-I., 214
- operculum, 41
- orbitofrontal cortex (OFC)
 and aging, 232–234
 and expert memorizers, 116, 118
 and gustative expertise, 87–91
 and olfactory expertise, 92–94
 and the gustatory system, 41–42
 in perceptual brain, 38
- Outliers* (book), 245–246
- own-age effect, 51
- own-race effect, 50–51
- P300, 78
- Pantev, C., 191
- paradox of expertise, 112
- parahippocampal gyrus (PHG)
 and calculation expertise, 125
 and expert memorizers, 119–120
 and long-term memory, 104
 and spatial expertise, 162–165
 development of, 19
 in board game problem solving, 154–157
 in pattern recognition, 149–151
- parahippocampal place area (PPA), 149–150
- parietal lobe, 77
- parieto-occipital junction (POJ), 103–104
- Pascual-Leone, A., 178–179
- pattern recognition
 definition of, 8
 in board game expertise, 141–144, 149–151
 in motor expertise, 197–201
- percept, 36
- perception
 adaptability of, 42–45
 and reality, 36
- perception anatomy
 auditory system, 39–37
 gustatory and olfactory systems, 41–42
 tactile system, 41
 visual system, 37–39
- perceptual expertise
 and action in sports, 209
 and musical notation, 74–77
 chunks/knowledge structures in, 10
 definition of, 4
 fingerprint expertise and, 71–74
 radiology as an example of, 7, 12, 34–35, 65–71
- perfect pitch, 77–82
- Perfume* (novel), 91, 94
- Pesenti, M., 123–126
- photographic memory, 106

Index

297

- piriform cortex
and aging, 233
and olfactory expertise, 94
in olfactory system, 42
- piriform gyrus, 94
- planum polare (PP), 82
- planum temporale (PT), 81
- Plassmann, H., 89–90
- ply, 9
- point light manipulation, 216–217
- Pollack, S. D., 51
- positron emission tomography (PET)
and auditory expertise, 78
and calculation expertise, 124–126
definition of, 16
- postcentral gyrus
in perceptual brain, 38
in the somatosensory system, 41
- posterior cingulate cortex (PCC), 219
- posterior cingulate gyrus (pCG), 68
- posterior dorsolateral prefrontal cortex
(pDLPFC), 79–80
- posterior middle temporal gyrus (pMTG)
and object recognition, 147–148
board game problem solving, 154–157
in pattern recognition, 149–151
- posterior middle temporal lobe (pMTL),
26–27
- posterior parietal cortex, 39
- posterior superior temporal sulcus
and AON, 210
and emotions, 54
- practice
and expertise, 234–235
deliberate practice, 243–248
- precentral gyrus, 190
- precentral sulcus (PCS), 124–125
- precuneus (PCun)
and expert memorizers, 119–120
and long-term memory, 104
in board game problem solving, 154–158
in pattern recognition, 149–150
- prefrontal cortex, 229
- premotor cortex (PM)
and abacus calculations, 130–133, 135
and expert memorizers, 117
- and musical notation, 76
and sports deception, 219
and the action observation network,
210, 215
- and the neurology of sports anticipation,
217
- in board game problem solving, 154–157
- in motor system, 172–174, 181
- Price, C., 68
- primary auditory area (A1), 39–37
- primary gustatory area, 41
- primary motor cortex (M1)
anatomy of, 172–174
change in during skill acquisition,
178–183
- primary olfactory cortex
and blindness, 92
in olfactory system, 42
- primary somatosensory cortex (S1), 41
- primary visual area (V1)
and tactile expertise, 84
and visual expertise, 60
definition of, 37, 38
- procedural memory
and motor expertise, 172
definition of, 105
- production, 145
- production system model, 144–145
- prosopagnosia, 49
- pruning, 20, 23, 159
- radiological expertise
and expertise in other fields, 226
cognitive mechanisms in, 62–65
neurology of, 65–71
pattern recognition in, 142
- Radue, E., 67
- randomization paradigm, 196
- Raz, A., 115–117
- recall task
and board game expertise, 139
and motor expertise, 195–196
in pattern recognition, 150
- relative pitch, 77–80
- Renier, L., 92
- retinotopic map, 37

- retrieval cue, 103
- retrieval structures
 - and hierarchical knowledge, 111–112
 - and LTM, 111
 - and LT-WM, 113
- retrosplenial cortex (RSC)
 - and aging, 231
 - and expert memorizers, 115, 120
 - and long-term memory, 104
 - and spatial expertise, 163
 - in board game problem solving, 154–157
 - in pattern recognition, 149–151
- Richler, J., 50
- Rizzolatti, G., 208–209
- Rombaux, P., 92
- Royer, J.-P., 94–95, 232–234
- Saariluoma, P., 162
- satisfaction of search (SOS), 12
- schemas
 - and chunking, 194
 - in memory, 65, 113
- Schlaug, G., 79–82, 189–192, 242
- scripts, 194
- secondary gustatory cortex, 41
- secondary motor cortex, 173
- secondary olfactory cortices
 - and blindness, 92
 - and olfactory expertise, 94
 - in olfactory system, 42
- secondary somatosensory area (S2), 41
- semantic memory, 105
- sensation, 36
- senses
 - and perception, 36–37
 - auditory system, 39–37
 - gustatory and olfactory systems, 41–42
 - tactile system, 41
 - visual system, 37–39
- sensory homonucleus, 41
- Seubert, J., 93
- shogi, 154–158
- short-term memory (STM)
 - and motor expertise, 195
 - and working memory model, 103–104
 - definition of, 103
- Simon, H., 140–141, 245
- skill acquisition, 178–185
- skill acquisition approach to expertise, 4, 194, 236–237
- skilled memory theory, 111–112
- smell, 42
- Smith, Will, 48
- social network, 220
- somatosensory cortex
 - adaptability of, 177–178
 - and musical expertise, 191
 - and musical notation, 76
 - and the action observation network, 213
- somatosensory perception, 41
- Sommer, W., 55–56
- somatotopic map, 41
- spatial expertise
 - cognitive mechanisms in, 161–162
 - nature versus nurture in, 240–241
 - neurology, 162–165
- spatial occlusion, 201
- speedup of encoding and retrieval, 112
- sports, 212–215
- Sports Gene, The* (book), 246
- storytelling strategy, 116–117
- strategic memorizers, 107–109
- striate cortex, 37
- striatum
 - and basketball expertise, 187
 - definition of, 184
- Stromeyer, C., III, 107
- structural neuroimaging techniques, 16
- superior longitudinal fasciculus, 160
- superior memory. *See* memory
 - expertise
- superior parietal lobe (SPL)
 - and abacus calculations, 130–133, 135
 - and the action observation network, 210, 214, 215
 - and the neurology of sports
 - anticipation, 217
- superior temporal gyrus (STG)
 - and auditory expertise, 78, 80, 82
 - and expert memorizers, 115
 - location of, 40

Index**299**

- superior temporal sulcus (STS)
and auditory expertise, 78, 80, 82
and face perception, 54
and the action observation network, 210
and the neurology of sports anticipation, 217
- supplementary motor area
and motor skill acquisition, 185, 187
in board game problem solving, 154–157
in motor system, 172–174
- supplementary motor area (SMA)
and motor imagery, 181
and the action observation network, 214
- supramarginal gyrus (SMG)
and calculation expertise, 124–125
and musical notation, 76
and object recognition, 147–148
and working memory, 103
in pattern recognition, 150
- Süsskind, P., 91
- Sylvian fissure (SF), 76
- tactile experience hypothesis, 238–240
- tactile expertise, 83–85, 238–240
- Talent Code* (book), 246
- Talent Is Overrated* (book), 246
- talent perspective, 247–248
- Tanaka, S., 130–131, 135
- taxi driver expertise
nature versus nurture in, 240–241
spatial expertise, 161–165
- telegraphy, 193–195
- template theory (TT), 145
- templates
and chunking, 194
and template theory, 145
in board game expertise, 141–144
- temporal lobe
and AON, 26
and radiological expertise, 66
- auditory areas of the, 39–37
development of, 19
of expert's brain activation, 22–23
- temporal occlusion, 201, 215–217
- thalamus
in motor system, 175
in olfactory system, 42
- Thatcher, Margaret, 47–48
- theory of biological limits, 247
- Thicke, Robin, 77
- think aloud technique
and board game expertise, 137–138
in cognitive expertise, 9
- Thompson, P., 47–48
- time paradox in sports, 198–201
- tone recognition, 82
- tonotopic maps, 40
- top-down processing
and gustative expertise, 85–91
and pattern recognition, 142
and tactile expertise, 83–85
definition of, 37
- training studies
and abacus calculations, 134–135
and aging, 231–232
definition of, 109
expert memorizer, 118–120
- transcranial direct current stimulation (tDCS), 176
- transcranial magnetic stimulation (TMS)
and brain plasticity, 43–45
and motor expertise, 205–206
and motor expertise viewing, 204
and musical notation, 191
in motor system, 173, 178–179, 183
- transfer, 83
- two-stage theory, 65
- typing expertise, 187
- use it or lose it principle, 164, 182–183
- V1
and tactile expertise, 84
and visual expertise, 60
definition of, 37
- Valenzuela, M. J., 232
- Vanderkolk, J., 72–74
- van Kooten, L. A. J., 54

- ventral stream
in auditory system, 40
in visual system, 39
residing in temporal lobe, 23
- ventrolateral prefrontal cortex (VTPC)
and abacus calculations, 131–133
and working memory, 103
- verbal information, 103
- verbal protocols, 137
- visuo-spatial imagery. *See also* method
of loci
and abacus calculations, 24, 126–135
and right side of the brain, 227–228
and the hippocampus, 162–165
and working memory, 103
- visual cortex
adaptive nature of, 92–93
and olfactory expertise, 92
- visual deprivation hypothesis,
238–240
- visual expertise
and fingerprint expertise, 71–74
and musical notation, 74–77
and radiological expertise, 65–71
brain areas affecting, 59–61
- face perception, 45–58
importance of in everyday life, 45
- visual system, 85–91
- voxel-based morphometry (VBM), 16, 183
- Wan, X., 154–158
- Ward, P., 197
- Wenzel, U., 187
- what pathway, 39
- where/how pathway, 39
- white matter, 16
- Williams, A. M., 197
- Williams, Pharrell, 77
- Williams, Serena, 171–172, 225–226
- Williams, Ted, 198–199, 235
- wine selection expertise, 85–91
- Wiseman, R., 85
- Wolfe, J., 64
- Wong, M., 238–239
- Wong, Y., 74–76
- Woollett, K., 241
- working memory (WM), 103–104
- Wright, M., 212, 215–217, 218–219
- Zatorre, R., 78, 81–82