

## Index

- Allocentric, 7, 115–121, 127, 132
  - and blindness onset, 167–168
- Amblyopia, 9, 148, 150, 153
- Amodal. *See* Supramodal
- Auditory attention, 24–28
  - and ERPs, 25
  - and eye movements, 25
  - selective and divided, 25–28
- Auditory egocenter, 21–24
  - and blindness onset, 163
- Auditory memory, 26–27
- Auditory sensory compensation, 15–29
  - and blindness onset, 162
  - ERPs, 17
  - for intensity discrimination, 15–16
  - for sound localization, 17–21
  - for temporal resolution, 16–17
- Autobiographical memory, 164–165
- Braille, 33–43, 82, 108, 125
  - and hemispheric asymmetry, 194
  - and somatosensory cortex, 37, 174–176
  - and synesthesia, 165
  - and tactile acuity, 33–34, 38–39
  - and visual cortex recruitment, 170–172, 177–179, 182–183, 192–193
- Chess (blindfold), 57–58
- Ciclopean eye. *See* Visual egocenter
- Colavita effect, 4. *See also* Visual dominance
- Color
  - and blindness, 86
  - color blindness, 9
  - knowledge, 96, 111
  - and synesthesia, 165
  - V4, 65–66
  - and visual imagery, 78
- Contrast sensitivity, 9, 148–149, 152
- Cortical plasticity, 173–200
  - in auditory cortex, 174–175
  - and blindness onset, 170–172
  - and Braille reading, 175–176, 182–183
  - critical period, 147–149, 155, 163
  - crossmodal, 170–172, 173–174, 176–196
  - intramodal, 36, 170–171, 173–176, 181, 194–196
  - and language, 192–194
  - in low vision, 140, 146–147
  - maladaptive, 176
  - and memory, 192–193
  - modality-specific, 185–188
  - in monocular vision, 152–153
  - in multisensory areas, 182
  - and musical training, 174, 176, 180
  - in somatosensory cortex, 175–176
  - structural changes, 196–198
  - and synesthesia, 165
  - task-dependent, 185–187
  - and TMS, 177–179
  - underlying mechanisms, 194–196

- Dichotic listening, 17, 25, 28, 193
- Dorsal stream, 55, 66, 106, 180, 183–184
- Dreams, 79–80, 87, 165
- Dual coding theory, 57, 79
- Early blind. *See* Onset
- Egocentric, 115–116, 120–121, 127, 132
- Enucleation (monocular), 148–150
- Extrapersonal space. *See* Locomotor space
- Eye movements, 25
- Far space. *See* Locomotor space
- Grating orientation task, 33–34, 37, 41, 140–141, 163, 188
- Haptic test battery, 31–33
- Hearing, 12–15
- Hippocampus, 198
- Imagery, 49–73
  - and creativity, 61
  - definition, 49–50
  - general and specific images, 64, 72–73
  - imagery debate, 51–54, 75–76
  - learning and memory, 56
  - and long-term memory, 62–64
  - mnemonics, 56–58,
  - neural basis, 67–73
  - and numerical cognition, 60–61
  - parallelism with perception, 69–72
  - and primary visual cortex, 63, 68–69, 188
  - and reasoning, 58–60
  - visual vs. spatial, 59, 72–73
  - and working memory, 55–56
- Imagery in the blind, 75–87
  - and creativity, 93
  - and drawing, 83, 86
  - dreams, 79–80
  - and memory, 77–79
  - neural basis, 96–98
  - perspective, 83–87
  - picture recognition, 82–83
  - and reasoning, 93–95
  - vantage point, 84
  - visual vs. spatial, 95–96
- Individual differences, 131–134
  - and blindness onset, 169
- Language, 26–27, 57, 75, 110–111, 134
  - lateralization, 193–194
  - and occipital cortex, 178, 187, 192–193
  - and spatial images, 104–105
- Late blind. *See* Onset
- Lateralization
  - Braille, 194
  - language, 193–194
  - spatial processing, 194
- Line bisection, 109–110, 151
- Loci, method of, 56–57
- Locomotor space, 47, 81, 126–131, 167
- Long-term memory, 26, 31, 55–56, 61–64, 76, 118, 193
- Low vision, 137–147
  - sensory compensation, 138–141
- Mathematics, 60–61
- Matrix task, 88–91, 93, 95
  - in low vision, 142, 145–146
  - in monocular vision, 151–152
- Mental images. *See* Imagery
- Mental rotation, 52, 59, 76, 80–82, 87, 96, 131
  - and blindness onset, 167
  - haptic, 92, 125
  - neural basis, 72
- Mental scanning, 52, 63, 76, 80–82
  - and blindness onset, 167
  - in low vision, 144
- Mirror neurons, 198–201
- Molyneux question, 98–102
- Monocular vision, 147–153
- Multimodal. *See* Supramodal

- Multisensory interaction, 45–48, 114, 163
  - audiotactile spatial interaction, 48
  - auditory-tactile illusions, 46
  - and ERPs, 46
- Myopia, 138–141
- Navigation, 114–115, 126, 128–131, 133, 135
  - and blindness onset, 168–169
  - and echo processing, 17
  - and hearing, 129
  - mental navigation, 105
  - navigational devices, 134
  - vestibular, 129–131
- Near space. *See* Peripersonal space
- Nociceptive sensitivity, 42
- Numerical cognition, 60–61, 106–110
  - Braille reading, 108
  - ERPs, 110
- Occipital cortex. *See* Visual cortex
- Olfactory, 43–45
- Onset (of visual impairment or blindness), 133, 143–148, 155–172
- Orientation and mobility (O&M), 133–135
- Parallel setting task, 117–121, 132, 167
- Path integration. *See* Navigation
- Perceptual consolidation (auditory), 28–29
- Peripersonal space, 46–47, 81, 116–125, 166
- Perky's experiment, 50–51
- Perspective, 83–84, 99–100, 102, 161
  - and blindness onset, 166
  - and drawing, 84, 86
  - perspective taking task, 85, 117, 121–125, 166
- Phosphenes, 67, 97–98, 171, 189, 191
- Picture recognition, 82–83
  - and blindness onset, 166
  - in low vision, 143
- Pitch
  - absolute pitch, 13, 15, 181
  - discrimination, 13–16, 162, 181
  - and synesthesia, 134
- Plasticity. *See* Cortical plasticity
- Pointing task, 21–23, 84, 167
  - in near space, 117–120
- Prakash project, 100
- Primary visual cortex (V1), 63, 65–66, 68–69, 195
  - and blindness onset, 170
  - and Braille reading, 170, 172, 177–178
  - and memory, 192–193
  - in monocular vision, 147, 152–153
  - and phonological and semantic processing, 170–171, 192
  - and speech perception, 181
  - and verb generation, 182
- Pseudoneglect, 109–110
- Rehabilitation, 133–135
- Restored vision, 98–102. *See also* Prakash project; Molyneaux question
- Rotation. *See* Mental rotation
- Route representation, 126–128, 130
  - and blindness onset, 168–169
- Scanning. *See* Mental scanning
- Self-positioning ability, 26, 163
- Semantic knowledge, 110–112, 169
- Sensory compensation, 11–48
  - and blindness onset, 162–164
  - in low vision, 138–141
- Sensory substitution devices (SSD), 134–135, 189–192
- SNARC effect, 61, 106, 108
- Social cognition, 198–201
- Sound
  - frequency, 12–13
  - intensity, 13, 15–16
  - sound processing and crossmodal plasticity, 180–181
  - spectrum, 13
  - temporal order, 14–15

- Sound localization, 13, 17–21, 129
  - and blindness onset, 162–163
  - central vs. peripheral space, 20
  - echo, 14, 17, 27, 139, 163
  - and ERPs, 20
  - in low vision, 138–141
  - monaural and binaural cues, 14, 19–20, 171, 180–181
  - vertical vs. horizontal, 20–21
  - and visual cortex, 180–182, 188–189
- Spatial cognition, 113–134
  - and blindness onset, 167–169
  - body-centred representations, 167
  - definition, 113–114
  - in low vision, 144
  - object memory/relocation, 121–124, 132, 168
  - reference frames, 46–47, 115–117, 126–127, 132
  - spatial inferences, 116, 142–143
  - spatial updating, 116, 122
- Speech perception, 16–17
- Strabismus, 147–150
- Strategy (mental), 91–93, 125, 131
  - and blindness onset, 166–167
- Supramodal, 102–106, 153, 183, 201
  - and occipital cortex, 187
- Survey* representation, 126–129
  - and blindness onset, 168–169
- Symmetry, 33, 90–91
- Synesthesia, 165
  
- Tactile acuity, 30–31, 33
  - and blindness onset, 163–164
  - in low vision, 140–141
- Tactile attention, 41–43
  - and ERPs, 42
  - selective and divided, 42
- Tactile map, 80, 127, 146
- Tactile pressure sensitivity, 31
- Tactile sensory compensation, 31–43
  - passive vs. active, 39–40
  - for spatial discrimination, 33–38
  - for temporal perception, 32–33
  
- Taste, 43–45
- Texture, 29, 76, 100–101
  - texture discrimination task, 30, 33–34, 40–41, 163–164
- Theory of mind, 198
- Three-dimensionality (3D), 83–84, 88, 93, 117, 143, 166
- Touch, 29–43
  - passive vs. active, 39–40
  - receptors, 29–30, 33–36
  - and visual cortex, 179
  
- Ventral stream, 55, 66, 106, 183–185
- Ventriloquist effect, 5, 14, 114. *See also* Visual dominance
- Verbal memory, 26–27, 55, 94, 169, 192
- Visual acuity, 8–9, 99–100, 133, 137, 139, 142, 145, 146, 187
  - in monocular vision, 148, 152
- Visual buffer, 64, 69
- Visual cortex, 65–67, 97–98, 141, 188. *See also*
  - Primary visual cortex
  - and language, 192–193
  - and memory, 192–193
  - MT/V5, 66, 68, 100, 185, 188, 195
  - and tactile processing, 187
  - structural changes, 197
- Visual deprivation (short-term), 179–180
- Visual dominance, 4–5
- Visual egocenter, 21–24, 163
  - in monocular vision, 150
- Visual field, 8–9, 133, 144, 146, 149
  - peripheral vs. central, 19–20, 68, 137, 140
- Visual impairment, 8–9
  - estimates, 8–10
  - forms of, 8–9, 137–138
- Visual impedance effect, 94
- Visual prostheses, 189–192
- Visuo-spatial working memory (VSWM), 55–56, 64, 87–93
  - in low vision, 142
  - passive vs. active, 87, 131
  - simultaneous vs. sequential, 88–90, 96, 152–153

Vividness, 63–64, 67, 78

V1. *See* Primary visual cortex

Wayfinding. *See* Navigation

Weber's law, 108

*What* pathway. *See* Ventral stream

*Where* pathway. *See* Dorsal stream

Working memory (WM), 55–56, 77, 87, 132,  
141