

# Index

*For the benefit of digital users, indexed terms that span two pages (e.g., 52–53) may, on occasion, appear on only one of those pages.*

Figures are indicated by *f* following the page number

- access consciousness 19–20, 23, 29–30, 159  
adaptation effects  
    attention 98  
    binocular rivalry 44  
addressing system *see* index or addressing system  
affective experiences and narratives interaction 183–85  
affective learning 185–86  
agency self, 22–23, 170, 180  
    and emotions 165–66  
    loss of sense of 180–81  
amnesia 61, 145  
amygdala 57–58, 165–66  
analog 154, 202–4  
animals 25, 26, 151, 166–67, 169–70  
    intuitions 152  
    no-cognition 51  
    rats 64  
    *see also* monkeys  
anterior cingulate 57, 73  
anterior prefrontal area 73  
aphantasia 27–28, 129–30, 131–32, 160  
appearance boosting 96  
Aristotle 18  
Artificial Intelligence 142, 167–68, 203  
assertoric force 153–55, 157, 162, 164–65, 168–69, 211  
association cortex 24, 57  
Association of the Scientific Studies of Consciousness (ASSC) 5  
associative conditioning 185  
associative learning 186, 187, 190  
attention 9, 83–103  
    and conscious control of behavior models 4  
    endogenous 117–18  
    filling-in 97–99  
    iconic memory 84–85  
    inflation 92–94  
    inflation limitations 94–97  
    lesions and prefrontal cortex damage 73–74, 77  
    load theory 86–87  
    local theories 100–1, 132, 134  
    necessity for 85–86  
    overflow 89–91  
    post-cuing impact on early sensory activity 87–88  
    quality space 201  
    representations, single versus multiple levels of 99–100  
    richness of experience, apparent 88–89  
    speckled hen philosophical puzzle 83  
    summary statistics and peripheral vision 91–92  
    *see also* load theory of attention  
attentional blink 46–47  
attentional cueing 117  
attentional modulation 101  
autobiographical memories 187–88, 209  
autobiographical subjective narrative processing 209–10  
Baar, B. 14  
backfiring 89  
back-up systems 118  
Bayes, T. 153  
behavioral measures 61–62  
beliefs and reality 175–76  
benefits of consciousness 107–24  
    clinical applications 121–22  
    decoded neurofeedback (DecNef) and threat reduction 122–21  
    endogenous attention 117–18  
    evolutionary outlook 107  
    free will as an illusion 109  
    global theories 122–24  
    Impossible Situations 110–12  
    inhibition and exclusion 115–16  
    intuitively ‘improbable’ situations 118–19  
    metacognition 116–17  
    performance matching and statistical power 114–15  
    subliminal priming experiments, limits of 112–14  
    volition 107–8  
bilateral lesions 60, 61  
binocular rivalry 41*f*, 144  
    neural correlates of consciousness (NCC) 41–43, 44, 47, 48, 50–52  
    nonconscious 133  
biopsychism 137–38, 139, 146, 168, 203  
bistable percepts 41  
blindness  
    change blindness 71, 94  
    functional 60  
    inattentional 86, 88, 93, 94  
blindsight 3–4, 9, 28, 144–45  
    attention 85  
    decoded neurofeedback (DecNef) 119  
    global theories 130  
    Hard Problem 210  
    higher-order failures 164  
    higher-order thought or beliefs 154  
    intuitions 152  
    local theories 133–35  
    patient GY 45, 47, 115–16, 117–19  
    and primary visual cortex (V1) 35–36  
    subliminal priming 113–14  
    and V1 damage 52  
    *see also* super-blindsight  
blind spot 97, 98  
Block, N. 19, 50, 51, 84, 88–89, 92, 136  
Bloom, P. 184

- Boly, M. 61  
 Brickner, R.M. 61  
 Broca's area 60  
 Brown, R. 139, 151
- Cannon, T.D. 182–83  
 Carrasco, M. 96  
 causal inferences 177  
 causal reasoning 177, 180  
 central foveal vision 91–92  
 central versus peripheral vision 93  
 central workspace 24  
 centrist position 139–40, 145, 146, 175  
 cerebral cortex 36  
 Chalmers, D. 2, 214  
 change blindness 71, 94  
 change detection task 89–90, 90f  
 chemical inactivations 72–73  
 children and infants 25, 167  
 Clark, A. 198  
 claustrum 57–58, 146  
 Cleeremans, A. 139  
 clinical applications 121–22  
 Cobain, K. 3  
 cognitive control and quality space 201  
 cognitive dissonance 4  
 coherent synthesis, necessity for 25–26  
 collective consciousness 179  
 colour vision in Mantis shrimp 207–8  
 coma patients and experimental confounders 21–22  
 combination problem 212–13  
 computer programs 131  
 conceptual memory representations 188  
 conditioning, associative 185  
 confabulations  
     schizophrenia 181–82  
     split-brain patients 178–79  
 confounders 30, 51  
     *see also* experimental confounders; stimulus  
     confounders; task-performance capacity confounders  
 conscious episodic recall 69–70  
 conscious experience: qualitative aspects 197  
 consciousness as purposeful control 29–30  
 consciousness as the state an individual is in 29–30  
 conscious seeing 73  
 content mismatch 36–39, 135–36  
 contrivance 135–36  
 Corlett, P. 163–64  
 corpus callosum 60, 178  
 correlates *see* neural correlates of consciousness (NCC)  
 Cortese, A. 141  
 counter-conditioning with reward 120  
 counterfactual reasoning 177, 184  
 Cowan's K 90  
 Cowey, A. 115–16  
 Craske, M. 121  
 Crick, F. 3, 5, 215–16  
 'crisis of neurology' and placebo pain 188–89  
 criterion artifacts 113–14  
 crowding 94, 101  
 culture 28, 182, 186
- decoded neurofeedback (DecNef) 121  
     benefits of consciousness 123  
     fear and trauma 188  
     and threat reduction 119–21  
 Deecke, L. 107–8
- definitions 17–18  
 degeneracy 59–60, 77  
 Dehaene, S. 14, 16–17, 40–41, 47, 69, 110, 111–12, 123, 129–30  
 Del Cul, A. 71  
 delusions 163–64, 180–81, 182  
 Dennett, Dan 13, 99, 100  
 detection 77, 113, 144, 145–46  
     bias 95  
     change detection task 89–90, 90f  
     failures 73–74  
     and metacognition 140–41  
     tasks 71–72  
 Diamond, J. 190  
 Dienes, Z. 112  
 direct stimulation 72–74, 75–76  
 discriminability 113  
     quality space 200, 201  
     structural-relational view 198  
 discrimination task 45, 145–46  
     four-choice 90  
     two-choice 72, 130  
     visual 71  
 discriminators 142–43, 166, 167, 168–69, 208–9  
     fruit fly olfactory system 206  
     imagery phenomenology 160  
     index, gating and richness of experience 159  
     inner sense 156–57  
     quality space 200  
     schizophrenia 181  
 dispositionalist position 155  
 dissociation 145  
     *see also* double dissociation  
 distal cause versus the 'engine' itself 39  
 distractor effect 116  
 Doerig, A. 38  
 dominance  
     binocular rivalry 44  
     performance capacity 42–43  
 dorsolateral prefrontal cortex 57, 59–61, 64, 71, 72, 161  
 double dissociation 67–68, 131–32  
 double-drift illusion 37, 39–40  
 dreams 165  
     coma patients and experimental confounders 21  
     fast versus slow consciousness 187  
     implicit versus explicit reality monitoring 161–63  
     lucid 162  
 Durkheim, É. 179
- economics and political polarization 189–90  
 Edelman, G. 5  
 Einstein, A. 6–7  
 emotions 28, 166, 170, 189  
     affective experiences and narratives 183, 184–85  
     affective learning 185–86  
     and agency 165–66  
     beliefs and reality 175  
     fast versus slow consciousness 187  
 episodic memory 4  
 error detection 111–12  
 Europe 10  
 event-related potentials (ERP) 46–47  
 P3 component 47, 49  
 evolutionary outlook 107  
 exclusion 115–16  
 experimental confounders 129  
     and coma patients 21–22  
     and purposeful behavior 22–24

- exposure therapy 187–88  
 extrastriate areas and/or feedback projections 15, 37, 136  
 eye movements 99
- false consciousness 179  
 familiarity, implicit sense of 69–70  
 fast (System 1) thinking system 186–87  
 fear and trauma 187–88  
 feedback processes 134  
 feedforward only architecture 142  
 feedforward processes 15, 134  
 Festinger, L. 4  
 Feynman, R. 214  
 filling-in and attention 97–99  
 first-order state 68, 154, 155, 208–9  
 analog representations 203–4  
 imagery phenomenology 160  
 index, gating and richness of experience 157*f*, 158–59  
 inflation 164–65  
 inner sense 156, 157  
 quality space 200–1  
 reality monitoring and dreams 161  
 robot consciousness 211  
 flashbacks 187–88  
 Fleming, S. 65, 66–68, 69, 70, 71, 74  
 flicker fusion 44  
 four-choice discrimination task 90  
 free will 28  
 as an illusion 109  
 Freudians 191, 192  
 Freud, S. 191  
 Frith, C. 181, 182  
 frontal polar cortex 57, 63, 65  
 fronto-parietal network 39–40, 131  
 fruit fly olfactory system 205–7  
 functional advantages of conscious processing 27  
 functional blindness 60  
 functionalism 137–38, 139, 143–44  
 internal 138, 139  
 long arm 137–38  
 functional magnetic resonance imaging (fMRI) 87, 109, 110–11, 116, 119–20, 121, 122, 205  
 neural correlates of consciousness (NCC) 37–38, 39, 42, 44, 45–46, 48–49  
 functional movement disorders 189  
 functions of consciousness 24, 26  
 fundamental theories of consciousness 212
- Gabor patches 37, 38*f*, 87–88  
 gating mechanisms 158–59, 177–78, 182–83  
 Gazzaniga, M. 4  
 general theory of consciousness 151  
 generative adversarial networks (GANs) 141–43, 143*f*, 156, 158, 166, 200, 206  
 global anesthesia 21  
 global broadcast 208–9  
 global information access 23  
 global neuronal workspace theory 9, 14, 110, 131  
 global theories 13–14, 15*f*, 17, 24, 25, 131–32, 144  
 access consciousness versus phenomenal consciousness 19–20  
 attention 85, 86, 88, 91, 92, 94, 102  
 benefits of consciousness 122–24  
 binocular rivalry 44  
 centrism 139  
 children and animals 25  
 content mismatch in early visual areas 38
- contrivance 135–36  
 endogenous attention 117  
 functions of consciousness 24, 26  
 Hard Enough problem 169  
 Impossible Situation 110, 111–12  
 index, gating and richness of experience 159  
 intuitively improbable situations 118  
 lesions and prefrontal cortex damage 57, 68, 69, 77  
 machines and robots 25  
 neural correlates of consciousness (NCC) 24, 25, 45–46, 51  
 opposing dogmas 137, 138  
 performance-capacity confounders 47  
 performance matching and statistical power 114  
 problems 129–31  
 reality monitoring and dreams 161, 162–63  
 reports 49  
 richness of subjective experience 24  
 stimulus confounder 40–41, 42, 52  
 theoretical goal posts 16–17, 29  
 theoretical upshot 27, 28
- Gödel 2  
 gray zone 22
- Haidt, J. 184, 189  
 hallucinations 36, 73, 134–35  
 auditory 181, 182  
 reality monitoring and dreams 161, 162  
 schizophrenia 181, 182  
 sensory 163–64, 180–81  
 visual 164
- Hard Enough Problem 168–69, 170, 211–12  
 Hard Problem 19, 29, 197–217  
 analog representations 202–4  
 beliefs and reality 175  
 colour vision in Mantis shrimp 207–8  
 conscious experience: qualitative aspects 197  
 labeled lines and sparse codes 204–7  
 metacognitive benefits 201–2  
 quality space, ‘knowing’ 199–201, 199*f*  
 structural-relational view 197–98
- hearing 15–16  
 hemispatial neglect 178  
 here-and-now quality 27  
 hierarchical models 68–70, 69*f*, 130, 133–34  
 higher-order state 28, 151, 154–56  
 analog representations 203, 204  
 centrism 139  
 failures 163–64  
 Hard Problem 208–9  
 imagery phenomenology 160  
 impossible situation 111  
 index, gating and richness of experience 157*f*, 158–59  
 inflation 164–65  
 inner sense 156, 157  
 metacognitive benefits 202  
 parallel versus hierarchical models 68, 70  
 quality space 200–1  
 reality monitoring and dreams 161, 162–63  
 self, actions and responsibility 180  
*see also* discriminators  
 high-resolution perception 89–91  
 hippocampus 33–34, 57–58, 209–10  
 historical background 3–5  
 homophily 186  
 homunculus 75–76, 75*f*  
 Hume, D. 184, 189  
 hyperalignment 121

- iconic memory 84–85  
 idealism 214  
 identity view 34  
 imagery  
     mental 36, 161  
     phenomenology 159–60  
 implicit versus explicit reality monitoring: dreams 161–63  
 Impossible Situation 110–12  
 inattentional blindness 86, 88, 93, 94  
 index or addressing system 158–59, 200–1, 204, 208, 209–10  
 inferior parietal region 71–72  
 inflation 140, 144, 164–65  
 attention 92–97, 101, 102–3  
 inhibition 114, 115–16, 117, 118, 124, 130  
 response 111, 112, 131  
 inner sense 156–57  
 insular 57–58, 165–66  
 intention 109  
 motoric 73  
 introspection 211  
 intuitions 152–53, 189, 211–12  
 intuitively ‘improbable’ situations 118–19
- Jacoby, L.L. 115–16  
 James, W. 96  
 Jastrow, J. 4
- Kahneman, D. 186  
 Kant, I. 151  
 Kawato, M. 119–20  
 Kentridge, B. 117–18  
 Kenyon cells (fruit fly) 205–6  
 key issues 24–25  
 Knight, B. 61  
 Koizumi, A. 114, 120, 121  
 Koller, W.N. 182–83  
 Kornhuber, H.H. 107–8  
 Kuhn, T. 8, 215  
 Kwok, S. 67
- labeled lines 76, 204–5, 208  
 Lamme, V. 15–17, 89, 134  
 language 14, 60, 182  
 Lapate, R.C. 64  
 lateral competition 88  
 lateral geniculate nucleus 101  
 lateral prefrontal area 63, 73, 116  
 Lavie, N. 102  
 learned threat response 120  
 learning 63, 65  
     affective 185–86  
     associative 186, 187, 190  
     model-based 187  
     model-free associative 187  
     motor 4  
     vicarious 185–86  
 Ledoux, J. 122  
 Leibniz 7  
 lesions and prefrontal cortex damage 57–77  
     behavioral measures 61–62  
     conceptual confusions about lesions 58–60  
     controversial case studies 60–61  
     direct stimulation 72–74  
     double dissociation 67–68  
     metacognition 62–64  
     parallel versus hierarchical architectures 68–70
- perceptual metacognition 70–72  
 prefrontal cortex versus rest of brain 57–58  
 sensory cortices 74–76  
 specific lesion effects 65–67  
 Lewy body dementia 164  
 Libet, B. 107–8  
 Liu, S. 37  
 load theory of attention 86–87, 88, 102  
 local theories 14–16, 16*f.*, 17, 24, 25, 28, 29  
     access consciousness versus phenomenal consciousness 19–20  
     analog representations 203  
     attention 84, 85, 86, 88–89, 91, 92, 94, 97, 100–1, 102  
     beliefs and reality 175  
     benefits of consciousness 123  
     centrism 139  
     children and animals 25  
     content mismatch in early visual areas 38  
     contrivance 135  
     distal cause versus ‘engine’ 39  
     functions of consciousness 24  
     Hard Enough problem 169  
     Impossible Situation 111  
     lesions and prefrontal cortex damage 57, 73–74, 77  
     machines and robots 25  
     neural correlates of consciousness (NCC) 51  
     opposing dogmas 136, 137–38  
     performance-capacity confounders 47  
     problems 132–35  
     purposeful behavior and experimental confounders 23–24  
     reality monitoring and dreams 161  
     richness of subjective experience 24  
     stimulus confounder 42  
     theoretical goal posts 16, 17–201
- Locke, J. 151  
 long-term memory 14  
 Luhrmann, T. 182
- McCurdy, L. 65, 66–67  
 machines and machine consciousness 25, 26, 168, 170  
     *see also* Artificial Intelligence; robots
- Macknik, S. 15, 71  
 Malach, R. 15  
 Maniscalco, B. 63, 70, 115, 131  
 Mantis shrimp colour vision 207–8  
 Martinez-Conde, S. 15  
 Marxist ideas 191  
 masking 119  
     metacontrast 45–46  
     *see also* visual masking
- matching method 95  
 memory 63, 65  
     autobiographical 187–88, 209  
     conceptual 188  
     episodic 4  
     iconic 84–85  
     long-term 14  
     metacognition 65, 66*f.*, 66–68, 162–63  
     recall, vividness of 162–63  
     recognition memory tasks 182–83  
     sensory memory representations 188  
     visual working 155  
     *see also* working memory
- mental disorders 192  
 mental imagery 36, 161  
 mental quality space 198–201, 199*f.*, 202, 215

- 'mesh' argument 89  
 metacognition 9, 144, 166–67  
   attention 94  
   benefits of consciousness 116–17, 123, 124  
   and detection 140–41  
   economics and political polarization 190  
   endogenous attention 117  
   explicit 163  
   generative adversarial networks (GANs) 143  
   global theories 130  
   imagery phenomenology 160  
   implicit and explicit 162  
   inner sense 156–57  
   intuitively improbable situations 118  
   lesions and prefrontal cortex damage 62–64, 68, 70, 77  
   nonconscious 113  
   parietal cortex 131  
   visual 65, 66  
   *see also* perceptual metacognition  
 metacognitive benefits 201–2  
 metacognitive efficiency 68–69  
 metacognitive insight impairment 73–74  
 metacognitive response (confidence) 68  
 metacontrast masking 45–46  
 meta-d measure 63, 65, 66  
 metaphysical alternatives 212–13  
 metaphysical view 214  
 Michel, M. 38, 59, 83, 144–45  
 Milner, B. 4  
 'mindless' approach 5–6  
 model-based learning 187  
 model-free associative learning 187  
 modules 14  
 monkeys 48, 109  
   lesions and prefrontal cortex damage 60, 64, 67, 71–72  
   no-cognition 50  
   volition 108  
 Morales, J. 59, 100  
 motion 15  
 motor control 14  
 motor cortex 33–34  
 motoric intention 73  
 motor learning 4  
 multivariate decoding approaches on EEG data 49  
 multivoxel pattern analysis (MVPA) 37, 119–20
- Naccache, L. 110  
 narratives and narrative system 192  
   affective experiences interaction 183–85  
   affective learning 186  
   economics and political polarization 189–90  
   fast versus slow consciousness 186, 187  
   narrative as 'consciousness' 179–80  
   narrative level 181–82  
   narratives of reality 176, 177–78  
   schizophrenia 182–83  
   self, actions and responsibility 180  
   symbolic causal narratives 176–78  
 narratocracy 190  
 near-threshold presentation experiments 52  
 necessity 34–35, 85, 112–13  
 Neisser, U. 85–86  
 neural correlates of consciousness (NCC) 24, 25, 26, 136, 145, 146  
   binocular rivalry 41–43, 44, 47, 48, 50–52  
   blindsight patient GY 45, 47  
   blindsight and primary visual cortex (V1) 35–36  
 content mismatch in early visual areas 36–39  
 contrivance 135, 136  
 correlates 33–34  
 derailment 33  
 distal cause versus the 'engine' itself 39  
 fronto-parietal network 39–40  
 global theories 45–46  
 lesions and prefrontal cortex damage 57–59, 60, 77  
 local theories 133  
 necessity and sufficiency 34–35  
 no-cognition paradigms 50–51  
 performance capacity confounders 42–44, 46–48, 49, 51–52  
 reports 48–49  
 stimulus confounders 40–42, 49, 51  
 Newton, I. 7  
 no-cognition paradigms 50–51  
 no-go or stop signal 111  
 non-conscious/non-consciousness 122, 131–32, 145  
   attention 85  
   benefits of consciousness 123  
   binocular rivalry 51, 133  
   content mismatch in early visual areas 37  
   contrivance 135  
   decoded neurofeedback (DecNef) 119–20  
   endogenous attention 117–18  
   fast versus slow consciousness 187  
   fear and trauma 188  
   fronto-parietal network 40  
   global theories 130  
   Hard Problem 210  
   higher-order thought or beliefs 154  
   Impossible Situation 110–12  
   information 26  
   intuitions 152  
   intuitively improbable situations 118  
   lesions and prefrontal cortex damage 68–69  
   local theories 133–34  
   memories 69–70  
   metacognition 116–17  
   narratives as consciousness 179–80  
   opposing dogmas 137–38  
   optimal Bayesians and phantom pain 153, 154  
   perception 145  
   split-brain patients and confabulations 178  
   stimuli 130  
   stimulus confounder 40–41  
   subliminal priming 113–14  
   volition 108  
   working memory 129–30  
 no-report paradigm 48
- Odegaard, B. 61, 93  
 olfactory domain 71  
 open-head surgery 72–73  
 opponency scheme 207–8  
 opposing dogmas 136–38  
 optic tract 60  
 optimal Bayesians 153–54  
 orbitofrontal cortex 71, 73  
 overview 13–30  
   access consciousness versus phenomenal consciousness 19–20  
   coherent synthesis, necessity for 25–26  
   coma patients and experimental confounders 21–22  
   definitions 17–18  
   global theories 13–14, 15f

- overview (*cont.*)  
 key issues 24–25  
 local theories 14–16, 16f  
 purposeful behavior and experimental confounders 22–24  
 theoretical goal posts 16–17  
 theoretical upshot 27–29
- Owen, A. 22
- pain  
 chronic 188–89  
 phantom 153–55  
 placebo 188–89
- Panagia, D. 190
- Panagiotaropoulos, F. 50
- panpsychism 136–37, 192, 212–13, 214
- parallel models 68–70, 69f, 130, 131, 133–34, 135
- parietal cortex 39–40  
 benefits of consciousness 122  
 binocular rivalry 44  
 global theories 14, 15f, 46, 129, 131  
 Hard Problem 209  
 higher-order failures 163  
 imagery phenomenology 160  
 lesions and prefrontal cortex damage 59–60, 63, 69, 70, 71  
 local theories 132  
 neural correlates of consciousness (NCC) 24, 52  
 performance-capacity confounders 47  
 reality monitoring and dreams 162–63  
 reports 48–49  
 stimulus confounder 42
- Parkinson's disease 164
- Passingham, R.E. 46, 109, 145
- Patient A 60–61
- Patient GY and blindsight 45, 47, 115–16, 117–19
- Patient HM (amnesia) 4
- pattern recognition networks 142
- Pavlov, I. 185
- Pavlovian conditioning 187, 188
- Pearl, J. 177
- Penfield, W. 72–73, 75–76, 75f
- Penrose, Sir R. 5
- perception 2, 9, 28, 131–32, 138, 144, 145  
 analog representations 203  
 attention 83, 86, 88, 89, 90, 91, 92–93, 96, 101, 102  
 bottom-up 166, 167  
 colour 199f  
 contrivance 135–36  
 generative adversarial networks (GANs) 142–43  
 global theories 14, 129–31  
 higher-order thought or beliefs 154–55  
 high-resolution 89–91  
 imagery 159–60  
 index and gating 158–59  
 inner sense 157  
 intuitions 152  
 lesions and prefrontal cortex 59, 68, 70, 77  
 local theories 15–16, 132, 133–34  
 low-resolution 90  
 neural correlates of consciousness (NCC) 40–41, 42–43, 45, 46, 47, 49, 52  
 non-conscious 113–14, 145, 152, 154, 205  
 optimal Bayesians and phantom pain 153  
 performance matching and statistical power 114–15  
 peripheral or unattended 102, 131–32, 133  
 predictive coding and generative adversarial networks (GANs) 141, 142–43
- self-recognized 170  
 stimulus confounder 40–41  
 subjective 52, 83, 86, 89, 114–15, 129–30, 131  
 subliminal priming 113–14  
 symbolic causal narratives 177–78  
 theories, higher-order 156  
 visual 14, 63, 69
- perceptual decision-making 93, 95
- perceptual experience 27–28, 198
- perceptual judgment 64
- perceptual load 86–87, 89
- perceptual metacognition 65, 66–68, 70–72, 74, 93, 94
- perceptual phenomena 95
- perceptual process 19
- perceptual reality monitoring (PRM) 151, 157f, 166, 167, 168, 170, 192  
 agency and emotions 165  
 analog representations 203  
 beliefs and reality 175  
 dreams 161, 162, 163  
 fast versus slow consciousness 187  
 fruit fly olfactory system 206  
 Hard Enough problem 168, 169  
 Hard Problem 208–9, 210, 215  
 imagery phenomenology 159, 160  
 implicit and explicit 163  
 inflation 164–65  
 metacognitive benefits 202  
 quality space 200–1  
 self, actions and responsibility 180  
 structural-relational view 198
- perceptual representation 92
- perceptual rivalry 50–51
- perceptual signal, internal 43
- perceptual switch 41–42
- performance matching and statistical power 114–15
- peripheral perception 102, 131–32, 133
- peripheral vision 91–92, 131–32, 140, 164, 165
- Persaud, N. 45, 115–16
- Peters, M. 113–14, 141
- phantom pain 153–55
- phenomenal consciousness 19–20, 23
- phenomenal overflow 84
- Phillips, I. 145
- phobias 121
- phonological task 110–11
- physics-centric approaches 212
- Pierce, C.D. 4
- Pincham, H.L. 46–47
- Pizarro, D.A. 184
- placebo pain and the ‘crisis of neurology’ 188–89
- political polarization and economics 189–90
- post-cue procedure 84–85, 84f, 87–88, 89, 96, 99
- posterior hot zone or posterior cortex 57–58
- postperceptual thinking 51
- post-traumatic stress disorders 121, 187–88
- prechange identification task 90
- precuneus 65, 66f, 67, 162–63
- predictive coding 141–42, 144, 156, 166, 167
- prefrontal cortex 26, 27, 28, 144, 146, 166–67  
 attention 100, 101, 102  
 benefits of consciousness 122  
 binocular rivalry 44  
 contrivance 135  
 distal cause versus ‘engine’ 39  
 endogenous attention 117  
 fronto-parietal network 39–40

- generative adversarial networks (GANs) 142–43  
 global theories 14, 15*f*, 45–46, 129, 130, 131  
 Hard Problem 209, 210  
 higher-order failures 163–64  
 higher-order thought or beliefs 154  
 imagery phenomenology 159, 160  
 Impossible Situation 110–11  
 inner sense 156  
 intuitively improbable situations 118  
 labeled lines and sparse codes 205  
 local theories 132–33, 134  
 metacognition and detection 140  
 neural correlates of consciousness (NCC) 24, 52  
 no-cognition 50–51  
 opposing dogmas 136, 138  
 performance-capacity confounders 47  
 quality space 200, 201  
 reality monitoring and dreams 161, 162–63  
 reports 48–49  
 schizophrenia 181  
 self, actions and responsibility 180  
 stimulus confounder 42  
*see also* lesions and prefrontal cortex damage  
 presupplementary motor area 109  
 primary visual cortex (V1)  
   attention 87–88, 101  
   blindsight 35–36  
   content mismatch in early visual areas 36–37  
   contrivance 136  
   feedback 15, 16–17  
   labeled lines and sparse codes 204–5  
   local theories 133, 134–35  
 priming approach 110–11, 112, 117, 122  
*see also* subliminal priming  
 psychogenic disorders 189  
 psychophysics method of adaptation 97–98  
 psychosis 163–64, 180–82  
 publication bias 39  
 pulvinar 146  
 purposeful behavior and experimental  
   confounders 22–24  
 qualia 146  
   nonfunctional 192  
   pure 192  
 Rahnev, D. 93, 111  
 rational behaviour/rationality 28, 146, 175–76  
 readiness potential 107–8  
 reality and beliefs 175–76  
 reality monitoring  
   implicit versus explicit 161–63  
*see also* perceptual reality monitoring (PRM)  
 recognition memory tasks 182–83  
 recurrency theory 134  
 recurrent activity 15, 16–17, 136  
 relational view of perceptual experiences 198  
 REM (rapid eye movement) 161, 163  
 repetition suppression 39  
 report  
   confounders 57, 59  
   lesions and prefrontal cortex damage 60, 73–74  
   local theories 132  
   neural correlates of consciousness (NCC) 48–49  
   subliminal priming 113  
 representations, single versus multiple levels of 99–100  
 repulsion effect (adapted out) 97–98  
 repurposing 156–57  
 response inhibition 111, 112, 131  
 responsible revolutionary planning 7–8  
 retinopathy 75–76  
 richness of experience 24, 26, 27, 132, 158–59  
   attention 88–89, 91, 92, 94, 96–97, 101, 102  
   local theories 133  
 robots 25, 131, 151, 167–70, 211–12  
 Rosenthal, D. 139, 151, 155–56, 198  
 Rothwell, J. 62–63  
 Rounis, E. 62–63, 70, 74  
 Rutherford 5–6  
 Sasaki, Y. 119–20  
 Schiller, R. 190  
 schizophrenia 180–83  
 Scott, R. 112  
 selective looking 85–86, 88, 93  
*see also* inattentional blindness  
 self, actions and responsibility 180  
 self-awareness 180  
 self-image 187–88  
 self-knowledge 72  
 self-monitoring mechanism 180  
 self-organizing metarepresentational account 139  
 semantic task 110–11  
 semiconsciousness 22  
 sensory cortices 74–76  
 sensory level 181  
 sensory memory representations 188  
 sensory representation 27–28  
 Sergent, C. 87  
 Shallice, T. 4  
 Shibata, K. 119–20  
 signal detection theory 62, 63  
 sinusoidal gratings 37–38  
 Skinner, B.F. 185, 187  
 Skinnerian conditioning 187  
 Sligte 89–90, 90*f*, 91  
 slow (System 2) thinking system 176–87  
 Solovey, G. 93  
 somatosensory areas 75–76  
 sparse coding scheme 76, 204–7  
 spatial neglect 71–72  
 speckled hen philosophical puzzle 83, 85  
 Sperling, G. 84, 84*f*, 85, 87, 89, 96, 99  
 Sperry, R. 4  
 split-brain patients 4, 145, 178–79  
 statistical power and performance matching 114–15  
 stimulus confounders 40–42, 49, 51, 57  
 stroke or external trauma 60  
 structural view of perceptual experiences 198  
 Suárez-Pinilla, M. 97–98  
 subjective ratings and accuracy 63  
 subjective visibility 71, 114  
 subliminal instruction figure 110–11  
 subliminal priming 110, 123, 131  
   decoded neurofeedback (DecNef) 119  
   global theories 130  
   limits of 112–14, 115  
   local theories 134  
 subliminal task instruction 111  
 subpersonal process 28  
 sufficiency and neural correlates of consciousness (NCC) 34–35  
 suicidal thoughts and behavior 187–88  
 summary statistics and peripheral vision 91–92

- super-blindsight 153
- supplementary motor area 73
- suppression 42–43, 44
- syllogistic inference 157
- symbolic causal narratives 176–78
- synesthesia 201
- Tascherau-Dumouchel, V. 121, 122
- task demand and perception 86
- task-performance capacity confounders 57, 144–45
  - contrivance 135
  - global theories 45, 129
  - inhibition and exclusion 116
  - lesions and prefrontal cortex damage 57, 65, 77
  - local theories 133, 134
  - metacognition 116–17
  - neural correlates of consciousness (NCC) 42–44, 46–48, 49, 51–52
  - performance matching and statistical power 114–15
  - subliminal priming 114
- task sets 110–11, 112
- Tegmark, M. 6
- temporal context effect 38
- temporal duration illusions 39–40
- thalamus 146
- theoretical goal posts 16–17
- theoretical upshot 27–29
- theta-burst 62–63, 64
- threat reduction and decoded neurofeedback (DecNef) 119–21, 122
- touch 15–16
- transcranial magnetic stimulation (TMS) 61–62, 63, 64, 65, 67, 70, 71–70, 72–73, 109
- trauma and fear 187–88
- traumatic brain injury 21
- two-choice discrimination task 72, 130
- unattended background 131
- unattended perception 131–32, 133
- unattended periphery 99
- unattended vision 140, 165
- uniformity illusion 97–98, 98f, 99–100
- unilateral lesions 60, 66
- United States 10
- Valsecchi, M. 95
- van Gaal, S. 111, 134
- vicarious learning 185–86
- 'virtual lesions' effect 36, 61–62
- visibility ratings 94
- vision
  - central foveal 91–92
  - central versus peripheral 93
  - unattended 140, 165
  - see also* peripheral vision
- visual cortex
  - attention 98, 100
  - binocular rivalry 44
  - lesions and prefrontal cortex damage 68, 75–76, 77
  - local theories 14–16, 16f, 133
  - V2 visual area 87–88
  - see also* primary visual cortex (V1)
- visual detection behavior 71
- visual discrimination task performance 71
- visual imagery, spontaneous 73
- visual masking 40, 40f, 47, 113, 114, 129–30
- visual metacognition 65, 66
- visual task performance 62, 63, 71
- visual working memory 155
- volition 73, 107–8, 109, 165, 166, 175
- Voss, U. 162
- Watanabe, T. 116, 119–20
- Webb, T. 143
- Wegner, D. 109
- Weiskrantz, L. 3–4, 52
- Wokke, M. 64
- working hypotheses 214
- working memory 9, 131–32, 167
  - attention 90–91
  - benefits of consciousness 123
  - generative adversarial networks (GANs) 142–43
  - higher-order thought or beliefs 155–56
  - Impossible Situation 111–12
  - non-conscious 113, 129–30
  - reality monitoring and dreams 161
- workspace functions 131
- Zhou, H. 37–52