

Index

- acquisition of expertise, 329–58
 adaptive specialization, social learning as, 52, 65, 81, 84
 alarm calls, 151–3, 205, 217, 224, 414–17, 419, 429, 435
 anthropocentrism, *see* culture, anthropocentrism
 antipredator responses, 150–3, 205–6, 217, 224, 414–18, 419, 420–1, 427, 429, 435–6; *see also* alarm calls
 apes, great, *see* great apes
 apprenticeship, 3, 332, 335, 351, 352
 asocial cues
 about food, 146, 154, 181, 188, 191, 194–5, 199, 204
 chemosensory, importance for mammals, 191, 204
 about potential predators, 150–1, 153
 reliability, *see* cue reliability, asocial visual, 98, 204
 asocial learning
 conditions favoring, 34–9
 convergent, as alternative explanation for an apparent tradition, 48, 128, 137, 161, 302–3, 305–6
 costs of, 35–7, 260
 diffusion curves, 43
 and environmental variability, 34–9
 frequency dependence, 41
 social learning, relationship to, 10, 34–5, 36, 37, 43, 65, 80, 84, 181
 aversions, food, *see* food, aversion learning
 Baldwin effect, 57, 428
 bats
 call convergence, 220
 following demonstrators to food sites, 38–9
 group-specific calls, 220
 horizontal social transmission, 220
 production learning of vocalizations, 200
 social foraging, 38–9
 behavioral drive, 57–8, 77, 109, 428
 behavioral innovation, *see* innovation, behavioral
 behavioral flexibility
 and brain size, 58, 77, 84
 definition, 58
 innovation as measure, 58–9, 84, 85
 and social learning, 58, 80–1, 84, 85
 tool use as measure, 84
 behavioral repertoire
 building blocks, 428
 size, variation in, 306
 species-level behavioral predispositions, 428
 behavioral variants, local
 between-group variation
 as insufficient criterion for a tradition, 23, 141, 160–1, 214, 298–9
 as unnecessary criterion for a tradition, 141–2, 299–300, 421
 see also specific taxa; genetic transmission; tradition; vocal traditions
 biases
 anecdotal data, primates versus birds, 110–12
 anthropocentrism, 3, 5, 94
 apes and traditions, 165, 321, 391
 field reports, 68, 80, 97
 primates and social learning, 110, 165, 297
 research effort, 59, 68, 71
 biological significance of traditions, 419–21, 426–8

- biological (*cont.*)
 fitness consequences, 420, 427
 innovation, dissemination of, 7
 niche construction, 7, 426
 reproductive isolating mechanisms, 228
- birds
 adaptations, range of, 95–6
 blood feeding, 162–4
 bullfinches, 117, 227
 cognitive convergence with mammals, 58, 95, 110
 cowbirds, 219–20
 Darwin's finches, 111, 112–13, 162–4, 223
 food processing, 99, 100, 102, 104–6, 113
 hummingbirds, 118, 222
 innovation
 and brain size, 4, 58–9
 comparison with mammals, 110
 experimental reports, 109, 111
 field reports, 117
 and social learning, 97, 110, 112
 imitation, 98, 111
 milk bottle opening, 57, 97–8, 117, 429
 parrots, 220, 222
 pigeons, 108, 109, 358
 redwinged black birds, 105, 109, 137
 social learning
 anecdotal reports, 99–2
 comparison with mammals, 98, 107–8, 110, 113–14, 116–18
 experimental reports, 103–6
 field reports, 118
 negative results, absence of, 98, 107–8
 songbirds, true, 216, 218–20, 222–4, *see also* birdsong
 tits, 57, 97–8, 111, 117
 tool use, 99, 102, 111, 112–14
see also birdsong; brain size, specific areas; neurogenesis, asocial learning; vocal learning; vocal traditions
- birdsong
 change
 directional, 223
 rate of, 223, 225–7
 copying fidelity, 225–6, *see also* birdsong, transcription errors
 cultural trap hypothesis, 46
 genetic influences, 215, 219
 and habitat characteristics, 225
 “half life” of types, 226
 longevity, 225
 migration, 222
 minimal unit of production, 216
 production learning, 222–4
 sexual selection, 227, 228
 subsong, 218
 transcription errors, 222–3, 224–5, 227
 usage learning, 218–20
 bond testing, *see* social conventions, as bond testing
- brain size
 and behavioral flexibility, 4–5, 58, 77, 84, 85
 and ecological hypotheses, 60, 84–5
 encephalization quotient, 61, 63
 and evolutionary rates, predictions, 57–8
 and group size, 60, 67, 81, 85
 hippocampus and food storing, 4, 60
 hyperstriatum ventrale, 95
 and innovation, 4, 58, 110
 and innovation, 4, 58–9, 73–7, 82–4, 87, 109–10
 predictions, 57, 58, 77, 109
 measures, selection of
 absolute measures, 62–3
 relative measures and difficulties
 estimating body size, 61–3
 specific neural systems, 60
- neocortex
 and diet, 60
 and group size, 60, 67, 81, 85, 116
 and innovation, 60–1, 110
 ratio, 63
 and social learning, 60–1
see also executive brain
- neostriatum, 4, 95, 110
 progression index, 61
 and social hypotheses, 60, 67, 85, 116
 and social learning, 4, 73–7, 82–5, 87
 predictions, 57, 58, 77, 85
- striatum, 110
 telencephalon, 95, 109
 and tool use, 66, 73–5, 76, 77, 82–3, 84
see also behavioral drive; executive brain; forebrain; intelligence; neurogenesis
- CAIC, *see* comparative analysis, by independent contrasts
- calls, *see* alarm calls; vocal learning; vocal traditions
- capuchins
 antipredator responses, 151–4, 366, 414–18
 alarm calls, 151, 152, 414–16, 417, 419
 demographic patterning, 415–16
 mobbing, 151–3, 366, 414, 416–17
 ontogeny, 415–17

- see also* capuchins, predator identification
- army ant following, 408–9
- between-group variation, 1–2
- food preferences, 202–3, 391–2
- food-processing techniques, 381–5, 407–12
- hunting, 413–14
- manipulative skills, 367, 381–5
- neophobia, 192
- potential competitors, treatment of, 418
- predator recognition, 417–18
- branch use, 366, 367
- chimpanzees, similarities to, 365, 366–7, 380, 384, 392
- clubbing, 366, 367, 382
- diet, 391–2
- extractive foraging, 365–6, 369, 371, 372–3, 374–85, 407–8
- female philopatry, 397
- field tests, proposals, 150–3, 383–5, 417–18
- food
- aversion learning, 193, 194
 - processing techniques, 365, 371, 375–7, 381–5
 - selection, 188, 192, 194–5, 196, 197
 - see also* capuchins, fruit, husked; capuchins, learning, food-processing skills; capuchins, social facilitation
- fruits, husked, 367, 369, 371–5
- availability, 372–4, 378–9
 - distribution, 374, 383
 - nutritional value, 374–5, 383
 - see also* capuchins, food-processing techniques
- games, 401–4
- geographic range, 391
- geographic separation of populations, 393–4
- hunting, 413–14
- interspecific interactions, 412–19
- coatis, 413–14
 - howler monkeys, 418
 - humans, 192, 418–19
 - indigo snakes, 151, 153
 - squirrels, 413–14
- leaf wrapping, 408–9, 410, 411
- learning
- aversion, food, 193, 195
 - food-processing skills, 377–81
 - mechanisms, 187, 197, 366–7, 368, 379–80, 380–1
 - reasons for reliance on, 391–2
- scaffolding, 417
- social, opportunities for, 195–6, 377, 392, 416
- teaching, 416
- see also* capuchins, social facilitation
- manipulation, 365–8, 369, 375–6, 381, 383
- neophobia, 192, 193, 197, 206
- dissipates with repeated exposure, 193, 195, 197
 - social facilitation
- pounding, 365, 367, 371, 408, 410, 411, 412
- predator identification, 151–3, 414–18, 420–1, *see also* capuchins, antipredator responses
- rubbing, 365, 408, 410, 411, 412
- social conventions
- functions, 405–6, 419–20
 - demography, 419
 - games, 401–4
 - geographic and temporal distribution, 404–5, 421
 - hand sniffing, 399–400
 - longevity, 419–20
 - sucking of body parts, 400–1
- social facilitation
- food processing, 368, 380
 - neophobia, reduction of, 196–200, 204
 - safe diet, not used to identify, 201–2, 204–6
 - see also* capuchins, learning
- social organization, 380, 397, 419
- social tolerance, 190, 196, 377, 380, 392, 397
- substrate use, 365, 369, 371, 373, 375, 381–3
- tool use, 311, 365–7, 369, 382, 392
- traditions, 151–3, 203, 381, 383–4, 393, 419–21
- cetaceans, 220–2
- baleen versus toothed, 242
 - humpback whales, 221–2, 223, 224–5
 - killer whales, 221, 224, 228, 242, 262
 - sperm whales, 217
 - tool use, 114, 238–9, 240, 250, 253–4, 259
 - see also* dolphins, bottlenose
- chimpanzees
- ant fishing, 179, 281, 304
 - between-group variation, 268–9
 - behavioral repertoire size, 307
 - food-processing techniques, 269, 303–4, 320
 - gestures, 304

- chimpanzees (*cont.*)
 social conventions, 269
 vocalizations, 217–18
 capuchins, similarities to, 365, 366–7, 380, 384, 392
 culture, question of, xiv, 3, 15, 94, 179, 269
 humans, comparison, 154, 354
 hunting, 281, 352–3
 leaf swallowing, 289–90, 312; *see also* Chimpanzees, medicinal plant use
 medicinal plant use, 269, 289–90
 nut cracking, 303–4, 334–5, 352
 pant hoots, 218, 354
 social conventions, 269
 social tolerance
 and food-related behaviors, 281, 318–20, 353
 tool kit size, 317–18
 teaching, 352
 tool use, 303–4, 316, 317–18, 320, 331, 352
 and party size, 317
 sex differences, 316, 352
 and social tolerance, 317–20
see also chimpanzees, ant fishing; chimpanzees, nut cracking
 traditions, 179, 218, 269, 290, 303–4, 320
 cognitive mapping hypothesis, 85
 comparative analysis, 19, 21, 71–2
 correcting for phylogeny, 63–5
 and identification of species likely to transmit traditions, 86–7
 by independent contrasts (CAIC), 20, 64–5, 72, 76–77
 competition, foraging
 scramble, 115–16
 scrounging, 115
 social learning, 281, 380
see also social tolerance
 complex manipulation, *see* manipulation, complex
 conventionalization, 8
 conventions, *see* social conventions
 convergent, independent learning, *see* asocial learning
 copying
 errors and the origins of traditions, 222–3, 224, 227, 228
 fidelity, 222, 225–6
 human culture, 322–3
 as insufficient explanation of skill acquisition, 11
 mate choice, 45
 CRA, *see* cue reliability approach
 cue reliability
 asocial cues, 134, 137, 148, 150, 188
 definition, 129, 136
 social cues, 134, 136–7, 148
 cue reliability approach
 age–sex classes, 136, 142–3, 146, 147, 148
 description, 127–30, 137–8, 139
 dominance rank, 136, 142–3, 146, 148
 feeding competitors, traditions about, 418
 food preferences, traditions about, 132, 134–5, 144–50
 cue reliability, 148
 reliability threshold, 145–8
 selecting target population, 144–5
 shortcuts, 148–50
 limitations, 138, 139
 medicinal plant use, traditions about, 154
 payoffs, 129, 132–6, 147, 151–3
 predators, traditions about, 133–5, 150–3, 417–18
 cue reliability, 153
 reliability threshold, 151–3
 selecting target population, 150–1
 profitable behaviors, 130–1, 141–2
 test, 128, 137, 139, 143, 149–50
 universal behaviors, 141
see also cue reliability; reliability threshold
 culture
 anthropocentrism, 3, 5, 94, 329
 chimpanzee, 3, 15, 94, 179, 269
 human
 emergence of, 322–333
 versus nonhuman, 2, 322, 329
 material, 392
 notions of, 2–3, 267, 322, 329
 orangutan, 179, 342–51
 and phylogenetic association with humans, 3–4, 94, 110, 322–33, 329
 protoculture, 2, 94
see also diffusion of learned traits; social learning; social transmission; tradition
 deception, *see* Machiavellian intelligence
 demography and social learning, 300, 306, 336, 353, 397, 414–15, 419, 430–2
 dexterity, *see* manipulation; tool use, dexterity
 diet and evolution of social learning, 108–9, 118
 diffusion of learned traits
 age–sex classes, 49, 51, 273

- barriers, 284, 304–5
- curves
 - as evidence of learning processes, 42–5, 276, 278
 - hyperbolic sine, 43–4
 - linear, 43, 277
 - proposed studies, 44
 - sigmoidal, 42–3, 276
- innovations, 48–9, 268, 273–4, 277
- models, 42–5, 276
- pathways
 - as evidence of social learning processes, 49–51
 - in macaques, 274–6
- phases, 272
 - tradition, 273, 282
 - transformation, 273
 - transmission, 272–3, 274
- rates, 276–9, 287–9
- trait-specific effects, 37, 142, 273, 274, 277, 279, 281
- see also* longitudinal studies; social learning, social transmission
- dispersal, natal
 - dual-sex philopatry in bottlenose dolphins, 242
 - female philopatry in capuchins, 397
 - geographic barriers, 304–5
 - and social learning, 47, 51, 222, 304–5, 307, 356, 380
- dolphins, bottlenose
 - beaching, 238, 241, 256–7, 259
 - bird milling, 238, 252, 259
 - boat begging, 238, 240, 251–2, 259
 - bottom grubbing, 238, 252, 258, 259
 - convergences with primates, 236
 - corkscrewing, 239
 - culture, 236–7
 - diet, 237, 238
 - dive types, 239
 - foraging
 - group, 243
 - mother–calf similarities, 248, 250–1, 252, 253, 254, 256, 258, 259–61
 - ontogeny, 249–50, 253–4, 259–60
 - solitary, 243
 - time spent, 243
 - types practiced, 247–9
- leap and porpoise foraging, 238, 254–5, 259
- life history, 236
 - prolonged period of juvenile dependency, 240, 242, 258
 - weaning age and opportunities for social learning, 240, 242, 243, 251
- milling, 238, 252–3, 259
- philopatry, 242
- production learning, 220–1
- provisioning
 - human, 238, 251, 259
 - maternal, lack of, 242
- rooster-tail foraging, 238, 256, 258
- sex-biases
 - social affiliation, 243
 - social learning, 243, 251–2, 260
 - tool use, 253–4
- signature whistles, 221, 236
- snacking, 238–9, 247, 250, 255–6
- social organization, 242–3
- sonar, 261
- sponge carrying, 238–9, 240, 250, 253–4, 259
 - genetic relatedness among sponge carriers, 254
 - sex-biased transmission, 253–4
- strand feeding, 239
- surface types, 239
- tail-hit fish stunning, 239
- tail-out peduncle dive foraging, 239
- tail whacking on water surface as foraging technique, 239
- tool use, *see* dolphins, bottlenose, sponge carrying
- trevally hunting, 238, 250, 254, 257
- vertical social transmission, 242, 244, 258–62
 - vocal traditions, 220–221
- dominance rank
 - food, differential access to, 146, 281, 381
 - innovation, 51, 136, 276, 310
 - social learning, 44, 49, 86, 136, 142–3, 273, 281
- domain specificity, *see* intelligence, domain-general versus domain-specific capacities
- enculturation, 332–3
- environmental variability, 34–40
- ethology, 7
- executive brain
 - definition, 61
 - ratio, in primates, 63, 69–70, 73–7 and innovation, 73–7, 82–4 and social learning, 73–7, 82–4 and tool use, 73–5, 76, 77, 82–4
 - residual volume, in primates, 63, 69 and innovation, 74–6 and social learning, 74–6 and tool use, 74–5, 76

- executive (*cont.*)
 volume, in primates, 63, 69–70
 and innovation, 74–7, 82
 and social learning, 74–7, 82
 and tool use, 74–7, 82
- expected utility, 128–30, 134–6, 143
- experimental studies of social learning,
 21–4, 39–40
 captive, 39–40, 104–6, 175–7, 196–200,
 312–13
 cross-fostering, 218
 designs, 21–4
 field, 103, 414, 437
 proposals for, 44, 49, 86, 164, 175, 189,
 202, 385, 417, 431–3, 435, 437
- extractive foraging
 birds, 99, 100, 101, 102, 103–6, 112–14
 capuchins, 365–6, 369, 371, 372–3,
 374–85, 407–8
 chimpanzees, 179, 281, 303–4, 334–5,
 352
 hypothesis, 85
 orangutans, 179, 301, 302, 304–6, 320,
 331, 342–4
 rats, 131–2, 165–6, 170–1, 175–7, 178
see also capuchins, extractive foraging;
 tool use
- fads, *see* traditions, ephemeral
- feeding, social, 168, 195, 333; *see also*
 foraging, social
- field studies of social learning
 anecdotal, 99–102
 limitations of, 23, 24, 25, 27, 298, 433
 proposals for, 41–2, 113, 320, 383–4, 417,
 431–8
 useful applications of, 24, 27, 41–2,
 48–9, 86, 298–9, 433–4
see also experimental studies of social
 learning, field; longitudinal
 studies
- fish, social learning in
 foraging routes, 8, 39–40, 427
 maladaptive, 39–40
- Fisher, R. A., 97–8
- food
 aversion learning, 188, 193, 205–6
 social cues, 99, 101, 104, 105, 106, 109,
 137, 166–7, 169–70, 188–9, 199–200,
 204–5
see also food, social learning
 choice, 144, 188–94, 195–7, 204–6,
 436–7
 social cues, 101–2, 104–5, 166–70,
 171–2, 180, 181, 188, 195, 204–5,
 437
- competition, *see* competition, foraging
 difficult, 199, 330, 337
 embedded, 199, 330
 familiar, payoff for eating, 132–5, 144–7,
 193
 mechanical defenses, 330–1
 neophobia, 144, 169, 191–4, 196–9
 palatability
 as asocial cue, 146, 154, 189, 191,
 194–5, 199
 importance for mammals, 191
 toxicity, 146, 189, 194
 postingestive feedback, 181, 191–4
 problem solving, 339
 processing, *see* specific taxa
 provisioning, 81, 192, 268, 280–1
 sharing, 204, 356
 social facilitation, *see* capuchins, social
 facilitation
 social learning, 188–90, 203–6; *see also*
 food, aversion learning, social
 cues; food, choice, social cues
 toxicity, 144, 188–90, 192, 194, 204, 331
 unfamiliar, payoff for eating, 144–7, 193
see also feeding; extractive foraging;
 foraging; generalism, dietary;
specific taxa, food-related topics
- foraging
 routes, 39–40
 social, 38, 39–40, 190, 195, 307–10, 312,
 321, 333, 380, 397
 solitary, 116
see also hunting
- forebrain
 equivalent areas in birds and mammals,
 58, 95, 110
 size
 and innovation, 4, 58–59
 and social learning, 4
see also brain size, specific areas
- games, 401–4
- Garcia effect, 193, *see also* food, aversion
 learning
- generalism, dietary, 144, 194, 189–90, 192,
 272
- genetic transmission, 144, 194
 as alternative explanation for apparent
 tradition, 17, 48, 161, 214, 269,
 303
 and between-group behavioral
 differences, 17–18, 161–2, 164,
 214–15, 303
 canalized development, 18, 150, 303
 as explanation for a behavioral trait,
 17–18, 161–2, 164, 214–15, 269

- relatedness among dolphins that carry sponges, 254
- and song differences between bird populations, 215
- geographic barriers
 - natal dispersal, 304–5
 - social transmission, 284, 304–5
- gorillas, 76, 189, 353, 356
- great apes
 - acquisition of expertise, 329–58
 - apprenticeship, 3, 332, 335, 351, 352
 - development, 330, 335–57, 336, 352
 - diet, 330
 - difficult foods, 330–2
 - enculturation, 332–3
 - food sharing, 356
 - horizontal transmission, 355–6
 - humans, comparison, 336, 354
 - imitation, 332–3
 - life-history parameters, 335–7
 - medicinal plant use, 154, 289–90
 - niche construction, 333–5
 - problem solving, 337
 - scaffolding, 332–3, 335
 - social organization, 356, 358
 - social tolerance, 321–2, 337, 353–4, 355
 - tool use, 179, 316, 354
 - traditions, 329–30, 356–7
 - see also* chimpanzees; gorillas; orangutans
- gregariousness and social learning, 66–7, 108, 116, 188, 307–10, 312–15, 321, 429
- group comparison method, *see* group contrast model
- group contrast model, 14–17, 18–19, 179
 - false negatives, 16–17, 141
 - false positives, 16, 141–2
 - see also* method of elimination; regional contrast model
- group size
 - and brain size, 67, 81, 85
 - definition, 69
 - as index of sociality, 82
 - innovation, 380
 - party size and tool use, 316–17
 - and social learning, 66–7, 81–2, 108, 116, 357
 - see also* gregariousness and social learning; Machiavellian intelligence
- group structure, *see* social organization and social learning; *specific taxa*, *social organization*
- Haldane, J. S., 18
- Hinde, R. A., 97–8
- horizontal social transmission, 35, 48–9, 213, 220, 221–2, 223–4, 307, 313, 342, 347, 355–6, 434
- horses, 108
- humans
 - as potential predators of capuchins, 418–19
 - provisioning, effects on nonhuman animals, 192, 268, 239–40, 244
- hunting
 - apprenticeship, 352–3
 - by capuchins, 413–14
 - by chimpanzees, 281, 352–3
 - by dolphins, 237, 238
- Imanishi, K., 267
- imitation
 - apes, great, 332–3
 - birds, 98, 111, 117–18
 - culture, xiii, 94, 160, 322
 - definition, 11
 - monkeys, 187
 - tool use, 113
 - traditions, 11, 178, 160, 161, 430
 - “true”, 4, 161
 - see also* copying
- independent discovery
 - convergent
 - explanations for, 191, 194, 269, 270–2, 284, 404–5, 414
 - in monkeys, 131, 283, 284–7, 404–5
 - probability of, 49, 130–2, 143, 304
- inductive reasoning, 19
- information
 - donation, 195
 - extraction, 180, 188, 195–6
 - transfer, notions of, 9, 180
 - see also* diffusion of learned traits; social learning; social transmission; teaching in nonhuman animals
- innovation
 - age–sex classes, 276, 281, 310
 - behavioral flexibility, 58–9, 428
 - behavioral predispositions, 269–72, 404, 428
 - brain size, 4, 58–9, 73–7, 84, 109–10
 - definition, 57, 267–8, 429
 - dominance rank, 281, 310
 - economic bases for, 51, 112, 178, 281, 310, 429
 - forebrain size, 58
 - “key”, 6
 - innovators, identification of, 51, 276, 281, 380, 431

- innovation (*cont.*)
 object handling, 310, 311
 provisioning, 280–1
 social learning, 78–81, 82–4, 97–8, 110, 112, 187, 277, 281, 323
 social tolerance, 281, 309, 310–12, 380
 tool use, 82–4, 281
see also birds, innovation; diffusion of learned traits; independent discovery
- instinct, 267
- intelligence
 cognitive mapping hypothesis, 85
 deception, 63, 68, 77
 domain-general versus domain-specific capacities, 5, 80, 82, 84, 85, 323
 extractive foraging hypothesis, 85
 Machiavellian, 67, 82, 85, 116
 technical intelligence hypothesis, 66, 84–5, 323
 tool use, 323
see also adaptive specialization, social learning as; behavioral flexibility; brain size, executive brain; forebrain
- interaction rituals, *see* social conventions, as interaction rituals
- intergroup variation, *see* between-group variation
- interspecific interactions
 chimpanzees and diana monkeys, 334
 ground finches and boobies, 162–4
 niche construction, 334
 orangutans and hornbills, 334
see also capuchins, interspecific interactions; humans; hunting
- Japanese primatology, 267–8
- Lactase gene, *see* niche construction, lactose tolerance
- lactation, *see* life history, weaning age
- learning, *see specific types*
- life history
 acquisition of expertise, 335–42, 355, 380–1
 body size, 336–7
 cognitive development, 336–7, 339, 352
 definition, 336
 interbirth intervals, 280, 317, 343, 353
 lifespan and brain size, 61
 prolonged period of juvenile dependency, 236, 240, 242, 258, 336, 337
 and social learning, 242, 337, 380–1, 431, 434
 social tolerance, 337, 431
 toxin resistance, 147
 weaning age, 242
see also brain size
- local enhancement, 161, 187, 268
- longevity of traditions, *see* tradition, longevity
- longitudinal studies as evidence of social learning, 21, 23, 24, 27, 42, 48–9, 268
see also field studies of social learning
- macaques
 behavioral predispositions, 284, 286
 candy eating, 314
 coo calls, 218
 diffusion pathways, 274–6
 fish eating, 275, 277
 food washing, 131, 273, 275, 277, 313–14
 innovations, 272–4, 277
 Japanese, 115, 131, 192–3, 268, 273, 282–9, 313–14, 391
 placer mining, 313–14
 provisioning, effects of, 279–81, 314
 stone handling, 275–6, 279–80, 282–9, 313
 in Texas, effects of relocation, 192–3
 tool use, 311
 traditions, 274–6, 278–80, 282–9
 vertical transmission, 274–5
 Machiavellian intelligence, 67, 82, 85, 116
- Maladaptive social learning, 39–41, 288
- manipulation, 321, 365, 369; *see also* capuchins, manipulation; macaques, stone handling; tool use, manipulative organs
- Mate choice copying, 45
- Medicinal plant use, 154, 289–90
- method
 of agreement, 19, 22
 comparative, *see* comparative analysis
 of concomitant variations, 20, 24, 27–8
 of disagreement, 19, 22
 of elimination, 14–17, 299–300, 320–1
 group contrast, *see* group contrast method; method of elimination; regional contrast method
 joint, of agreement and difference, 19
 of residues, 20, 24, 27–8
 two-action, 22
 Mill, J. S., 19–21

- Mobility patterns and social learning, 6, 112
 birds versus mammals, 112
 migration, 51, 222
see also dispersal, natal
- neocortex, *see* forebrain, equivalent areas
 in birds and mammals; brain size, neocortex
- neophobia
 capuchins, 191–3
 about food, 144, 169, 191–4, 196–9
 human children, 194, 196–7
 Texas macaques, 192–3
- neurogenesis
 conservative patterns, 5, 62
 convergent evolution
 between bird taxa, 95, 96
 between birds and mammals, 95, 110
- niche construction
 definition, 5, 46, 333
 evolutionary significance, 5–6, 46–8
 lactose tolerance in humans, 5, 57
 milk-bottle opening in great tits, 57, 97–8
 mutualism, 6
 negative, 47–8
 selective pressures, modification of, 5–6, 46–8
 and social learning, 6–7, 46–7, 333–5, 352, 353, 355, 432
- nonsocial cues, *see* asocial cues
- Object
 manipulation 321, 365, 369
 reenactment, 187
see also tool use
- ontogenetic level of explanation, 7, 17–18
- ontogenetic ritualization, 407
- opportunities for social learning
 hypothesis, 306–22; *see also* social tolerance
- optimal foraging theory, 51, 144
- optimality, 39–40, 51, 136, 140, 144,
- orangutans
 behavior
 repertoire size, 306–7
 between-group differences, 300, 304–7, 315–16
 chimpanzees, comparison, 301, 307, 316, 320, 353–4
 culture, 179, 342–51
 feeding parties, 315
 food-processing techniques, 331, 342–51, 354–5
 difficult foods, 315, 337
 palm fruit processing, 350–1
 palm heart processing, 331, 344–8
 palm pith processing, 348–50
see also orangutans, tool use
 horizontal social transmission, 342, 347, 356
 life history, 337–42
 niche construction, 334, 344
 physical traces, 350–1
 problem solving, food-related, 339, 350
 rehabilitants, 343–51, 356
 social organization, 308, 315, 322, 338, 341, 343, 356
 social tolerance, 315–16, 321–2, 338, 340, 343, 341, 349, 350
 tool use, 179, 301, 302, 304–6, 320
 age–sex classes, 316–17, 343
 dominance rank, 316
Neesia, and party size, 301, 304–6, 342–3
 tree holes, 301, 305, 343
 traditions, 179, 301, 306, 320, 342, 357
 vocalizations, 301–2
 Wanariset orangutan reintroduction project, 343–4
- palatability, *see* food, palatability
- payoffs
 definition, 129
 as determinants of behavior, 112, 115, 132–6
- pinnipeds, 220, 224
- plasticity, *see* behavioral flexibility
- play, 278, 279, 282
- predation risk, 145
- predator identification, 137, 150–3, 205, 427, 435–6
- production learning, *see* vocal learning, production
- protoculture, 2, 94
- provisioning by humans, effects of, 81, 192, 268, 280–1
- rats
 black, 131–2, 165–6, 175–7, 178
 digging for food, 170–1, 178
 diving for food, 23–4, 165, 173–5
 fishing, 23–4, 165
 food, social learning about
 aversions, 166–7, 169–70
 feeding sites, 168–9
 how to eat, 172–9

- rats (*cont.*)
 mother's milk, 168
 olfactory, 168–70
 prenatal effects, 167
 and reversal of asocially learned food aversions, 170
 visual, 168
 what to eat, 166–70, 171–2
 foraging by wild populations, 165–6, 173, 174
 geographic range, 165
 hunting, 165
 neophobia, 169
 Norway, 165–75, 180–1
 pinecone stripping, 131–2, 165–6, 175–7, 178
 social learning
 mechanisms, 165, 167–70, 177, 178
see also rats, food, social learning
 about
 traditions
 field, 166, 172–7, 178
 laboratory, 166–72, 174–5
 regional contrast model, 14–17, 18–19, 130–1, 141–2; *see also* method of elimination; group contrast model
 reliability threshold
 definition, 129
 food, unfamiliar, 134–5
 potential predators, 134–5, 150–3
 sources of potential variation, 136, 146–8
 research biases, *see* biases
- scaffolding, 332–3, 379, 417
 scrounging
 in apes, 333, 335
 in birds, 115
 in monkeys, 115
 and learning, 41, 115
 producer–scrounger game, 115
 selection, multilevel, 6
 self-medication 154, 289–90
 sexual selection
 birdsong, 46, 227, 228, *see also* birdsong, cultural trap hypothesis
 mate choice copying, 45
 social conventions
 as bond testing, 405–6
 captive animals, 437–8
 capuchins, 399–405, 419–21
 chimpanzees, 397–8
 definition, 397
 design features, 406–7
 functions of, 405–6
 as interaction rituals, 406
 longevity, 419–20
 macaques, 397
 stability, 407
 social cues
 olfactory, 168–70
 physical traces, 168–9, 333–5
 visual, 168–9, 377
 social facilitation, 196–7, 200–2
 social foraging, *see* foraging, social; Feeding, social
 social learning
 adaptive function, 40, 427
 as adaptive specialization, 10, 52, 65, 80–1, 84
 asocial learning, relationship to, 10, 34–5, 36, 37, 43, 65, 80, 84, 181
 behavioral flexibility, 58, 80–1, 84, 85
 competition, 281, 380
 conditions favoring, 34–9, 41, 136–8, 188–90, 306–22, 430
 conventionalization, 8
 definition, 8, 9, 11, 107
 demography, 300, 306, 336, 353, 397, 414–15, 419, 430–2
 diet, 108–9, 118
 directed, 45, 48–51, 274–6
 dispersal, 47, 51, 222, 304–5, 307, 356, 380
 dominance rank, 44, 49, 86, 136, 142–3, 273, 281
 enculturation, 332–3
 and environmental variability, 34–9, 260, 430
 evolutionary process, effects on, 45
 fitness consequences, 40, 427, 428
 frequency dependence, 41, 47
 as generation process, 8
 and gregariousness, 66–7, 108, 116, 188, 307–10, 312–15, 321, 429
 and group size, 66–7, 81–2, 108, 116, 357
 and innovation, 78–81, 82–4, 97–8, 110, 112, 187, 277, 281, 323
 life history, 242, 337, 380–1, 431, 434
 maladaptive outcomes, 39–41, 228, 282
 models, 33–52, 127–55, 276–8, 306–10, 430, 431, 432, 436
 empirical tests, 38–40, 310, 315–20
 predictions, 37–8, 39, 42–5, 260, 310, 430
 “module”, 40
 naturalistic studies, 23, 24–25, 27; *see also* field studies of social learning
 niche construction, 6–7, 46–7, 333–5, 352, 353, 355, 432
 opportunities for, hypothesis, 306–22

Cambridge University Press

0521815975 - The Biology of Traditions: Models and Evidence

Edited by Dorothy M. Fragaszy and Susan Perry

Index

[More information](#)

Index 455

- salience of social partner, 9–10, 196–7
- sex-biased, 49, 51, 148, 243, 251–2, 260, 273, 352, 431
- sexual selection, 45, 227–8
- social organization, 115–16, 116–17, 356, 380–1, 435
- and social relationships, 10, 49; *see also* Social learning, social tolerance
- social tolerance, 10, 190, 281, 307–8, 312, 314, 321–2, 337, 355, 380–1, 429, 431
- socialization, 8
- and territoriality, 116–17
- and tool use, 66, 84, 99, 102, 111, 112, 113–14, 179, 253–4, 301, 311, 320
- trait-specific, 37, 142, 273, 274, 277, 279, 281
- see also* brain size and social learning; copying; culture; diffusion of learned traits; experimental studies of social learning; field studies of social learning; food, social learning; imitation; information; innovation; local enhancement; scaffolding; social conventions; social cues; social facilitation; social transmission; teaching; tradition; vocal traditions
- social organization and social learning, 115–16, 116–17, 356, 380–1, 435; *see also* dominance rank, social learning; gregariousness and social learning; social learning, and group size; social tolerance, and social learning
- social tolerance
- age–sex class variation, 281, 337, 340, 431
- apes compared, 321–2, 353–4, 355
- and behavioral repertoire, size of, 307–10, 315
- definitions, 309
- and innovation, 281, 309, 380
- kinship, role of, 314, 337, 338
- monkeys compared, 310–12, 321
- object handling, 311
- and social foraging, 190, 307–10, 312, 321, 380, 397
- and social learning, 10, 190, 281, 307–8, 312, 314, 321–2, 337, 355, 380–381, 429, 431
- tool use, 310–13, 316–20
- see also* dominance rank, social learning; scrounging; *specific taxa*, social tolerance
- social transmission
- chain, 39, 171, 172
- see also* horizontal transmission; social learning; vertical transmission
- socialization, 8
- socially biased learning, 10, 181; *see also* social learning
- song learning, *see* birdsong; vocal learning
- species-level behavioral predispositions, 269–71, 284, 286, 392, 428
- stimulus enhancement, 108, 187
- Taste cues, 188, 189, 191, 194
- teaching in nonhuman animals
- apes, great, 332–3, 335
- capuchins, 416–17
- definition, 416–17
- poor evidence for, 180, 189, 199
- scaffolding 332–3, 379, 417
- technical intelligence hypothesis, 66, 84–5, 323
- territoriality and opportunities for social learning, 116–17
- Thorpe, W. H., 227
- Tinbergen, N., 7
- tolerance, *see* social tolerance
- tool use
- birds, 99, 102, 111, 112–14
- capuchins, 311, 365–7, 369, 382, 392
- chimpanzees, 179, 303–4, 320, 331
- definition, 66, 369
- dolphins, 238–9, 240, 250, 253–4, 259
- economic bases for, 112–13, 179
- great apes compared, 179, 316, 354
- and innovation, 66, 84
- macaques, 311
- manipulative organs, 113–14
- orangutans, 179, 316
- social tolerance, 310–13, 316–20
- tradition
- adaptive, 40
- between-group variation as criterion, 160–1, 357
- definitions, 3, 12, 127, 160–1, 180, 267, 297, 322, 374, 398
- ephemeral, 12, 273, 420
- fidelity, 170–1, 430
- group contrast model, 14–17, 18–19
- group process model, 12, 13, 19
- longevity, 12–14, 24–25, 170–1, 213, 279, 419–21, 430
- method of elimination model, 14, neutral, 282
- regional contrast model, 14, 18–19, 130–1,

- tradition (*cont.*)
 - short-lived, *see* tradition, ephemeral
 - “space”, 12–14, 26, 420
 - statistical analysis, 51–52
 - see also* biological significance of traditions; cue reliability approach; social conventions; vocal traditions; *specific taxa*
- two-action design, *see* method, two-action
- usage learning, *see* vocal learning, usage
- vertical social transmission, 35, 48–9, 213, 242, 244, 258–62, 274–5, 307, 342, 434
- vervet monkeys, 116, 193, 217, 414
- vocal learning
 - comprehension, 215
 - minimal unit of production, 216
 - production, 215–16, 220–4
 - definition, 215–16
 - birds, 222–4
 - mammals, 220–2
 - usage, 216–20
 - chimpanzees, 217–18
 - cowbirds, 219–20
 - definition, 215
 - macaques, 217–18
 - parrots, 220
 - sparrow, white-crowned, 219
 - sperm whales, 217
 - vervets, 217
 - see also* vocal traditions
- vocal traditions
 - bats, 220, 228
 - budgerigars, 223–4, 228
 - chaffinches, 223, 225, 226–7
 - chimpanzees, 354
 - copying errors, 222–3, 224, 227, 228
 - copying fidelity, 222, 225–6
 - cowbirds, brownheaded, 219–20
 - Darwin’s finches, 223, 228
 - directional change, 223
 - dolphins, 221
 - indigo buntings, 223, 226
 - as isolating mechanisms, 228
 - harp seals, 224
 - horizontal, 220, 221–2, 223–4
 - humpback whales, 221–2, 224–5
 - killer whales, 221, 224, 228
 - migration, 222–3
 - orangutans, 301–2
 - random origins of, 222–3, 224, 228
 - rate of change
 - birds, 222–3, 225
 - mammals, 224–5
 - rufous-collared sparrows, 225
 - sexual selection, 227, 228
 - sperm whales, 217
 - village indigo birds, 222
 - see also* vocal learning
- Vygotsky, L., 332