

Index

ABRs. See auditory brain stem responses ACC. See anterior cingulate cortex acceleration, time, 265 accelerometers, 647, 658-660, 661 accommodation, in life story, 392 accommodative coping, 500-501 acetylcholine age effects on, 86-87 in age-related working and episodic memory decline, 83, 85-86, 92-93 in arousal, 103, 105-106 in attention, 171-172 in cognition, 83, 85-86 acetylcholine hypothesis of Alzheimer's disease, 105-106 achievement, grit association with, 501-502 actigraphy, 629, 647 activity participation, 440-442, 452-453 activity type and timing, 449-450 differential preservation versus preserved differentiation in, 446-448, 588 intervention based on, 451-452 life course considerations, 448-451 mental activity, 442-444 physical activity, 444-445 retrospective methods for study of, 448-449 social activity, 445-446 start of participation, 450-451 activity-regulated cytoskeleton-associated protein (Arc), 70-71 AD. See Alzheimer's disease affective arousal, 102 age-by-valence interactions, in memory, 236-238, 239-240, 243-247 alcohol, prenatal exposure to, 426 α2 antagonists, norepinephrine activity effects of, 108 Alzheimer's disease (AD) acetylcholine hypothesis of, 105-106 bilingualism impact on, 485 blood biomarkers of, 570, 573-576 brain reserve in, 33, 34

cholinergic innervations of hippocampus in, 85-87, 92 cognitive reserve in, 32-33, 34, 35, 36-37, 39-40, 424-425, 430-432 decision making and, 226 default mode network activation in, 14-15 epigenetic mechanisms in, 560-561 genetic influence on cognition in, 554 genetic risk factors for, 555, 556 histamine levels in, 109-110 LC-NE hyperactivity in, 106-110 narrative foreclosure in, 392 nutrition role in, 612-613 antioxidants, 614-615 B vitamins, 613-614 dietary patterns, 618-620 fruits and vegetables, 617-618 novel approaches to, 620 polyunsaturated fatty acids, 617 vitamin D, 616 vitamin K, 615-616 orexin levels in, 109 physical activity impact on, 646, 648 predicted prevalence of, 645-646 sleep apnea in, 635, 637 sleep role in, 628-629, 633, 638, 639 smell changes in, 191 tau pathology in, 94-95, 104 amphetamine, 88, 89 amygdala aging effects on, 238-240 in emotion recognition, 372-376 animal models of neuroadaptive aging, 67-68 of prenatal influences on cognitive aging, 425-427 anterior cingulate cortex (ACC), 372-376 anticholinergics, Alzheimer's disease risk and, 105-106 antidepressants, for late-life depression, 599 antioxidants, cognitive function impact of,

614-615



744 Index

apolipoprotein E (APOE) gene, 51, 555, 556, 557, age differences in personal past use, 558, 561 387-388 identity support through personal past use, Arc. See activity-regulated 386-387 cytoskeleton-associated protein life story and, 390-392 arithmetic strategy use in, 128-132, 133-135 memory and identity integration through Westerner and East Asian differences in, age differences in, 389-390 461-462 self-memory system in, 388-389 autobiographical memory base, 388 aging-related modulation of, 110-111, 305 autobiographical reasoning, 384, 389, 390 definition of, 102 automatic activation, 147-149 emotional, memory effects of, 236-240 autonomic arousal, 102 neurotransmitter compensation in, 101, 102, awareness of age-related change (AARC), 104, 110-111, 123 520-521 acetylcholine, 103, 105-106 awareness of aging, 520-521 dopamine, 102, 105, 109 cognitive function and, 522-524 histamine, 103, 105, 109-110 perceived control and, 521-522 norepinephrine, 102, 104-110 orexin, 103-104, 105, 109 B vitamins overarousal, 101, 106-110 cognitive function impact of, 613-614 serotonin, 102-103, 105, 109 supplements, 51-52 balance, 190-191, 703, 709 underarousal, 101, 104-106 assimilation, in life story, 392 BDNF gene. See brain-derived neurotrophic assimilative coping, 500-501 factor gene assistive robots, 726 behavior associative memory, 9-10 health-related, in cognitive function-wellbeing association, 537-538 attention age-related differences in, 161-162, 171-172, inappropriate, recognition of, 368-369 inhibition of socially undesirable, 322 bottom-up processes, 162-165, 273-274 inappropriate remarks, 322 compensation costs and, 165-169 prejudice, 322-323 motivation and emotion influences on, benzodiazepines, for sleep disorders, 638 169-171 bilingualism, 480-481, 492-493, 587-588 age-related changes impacting, 485, 491 top-down processes, 162-165, 273-274 definition of, 161-162 in cognitive functions, 482-483 positivity effect in, 169-171, 306-307 cognitive reserve advantages, 485 time perception and, 259-260, 266 in higher-level language processing, 491-492 Westerner and East Asian differences in, in language processing, 481-482 attentional deployment, emotion regulation and, in sensory perception, 482 306-307 transmission deficit theory consequences, attitudes, aging, 520-524 attribution, of causality, 740 transmission deficit theory of, 483-485 auditory brain stem responses (ABRs), 182 auditory language processing in, 488-490 auditory perception. See also hearing definition of, 481 age-related changes in, 179-181 higher-level language processing and, 491 bilingualism and, 482 discourse processing, 492 training of, 673 working memory and syntactic processing, auditory processing 491-492 in bilingualism, 488-490 individual variation in, 490-491 in sensory deficit hypothesis, 5-6 prevalence of, 480-481 speech perception in, 487-488 temporal, 181-182 auditory sensitivity, 181 binding deficit, 9-10 authoritarianism, 368-369 biomarkers. See blood biomarkers autobiographical memory, 383, 393 Birren, James, 385 cultural influences on, 462-463 birth weight, 427-428 functional approach to blood biomarkers, 568-569, 577, 589-590



Index 745

of cognitive health, 571–572, 573	catechol-O-methyltransferase (COMT) gene,
definition of, 569	556, 557
methodological challenges to development of,	causality
576–577	in activity-cognition associations, 446–448,
in neurodegenerative disease, 570, 573–577	588
rationale behind, 570	attribution of, 740
blood pressure, 340-342	in mobility and cognitive decline interrela-
bottom-up processing	tionship, 706
attention, 162-165, 273-274	CBT-I. See cognitive behavioral therapy for
time, 255–257	insomnia
top-down linkages with, 265–266	CCRCs. See continuing care retirement
brain	communities
fetal programming of, 424	cerebrovascular disease
predictive coding view of, 467–469	blood biomarkers for, 575
brain aging. See also functional connectivity;	depression with, 593, 603-604, 739
neural networks; specific structures	clinical features of, 594–596
cognitive reserve and, neuroimaging of, 39–40	neurobiology of, 596-598
emotion recognition difficulties caused by,	treatment of, 599–603
372–373	cholinergic hypothesis of cognitive aging, 92-94
evidence for, 373–374	cholinesterase inhibitors, 105–106
specific brain regions involved in, 374–376	chronic goals, 333
general principles characterizing, 47–49, 55	circadian rhythms
dimensionality, 48	age-related change in, 629
early influences, 49–51	inhibitory theory and, 154
environmental factors, 49, 51–55	phototherapy for, 637–638
neurocognitive plasticity and, 53–55	circuits. See neural networks
strategy perspective on, 127–128	clinical care, stereotype threat in, 407–408
trajectories of, 47–49	cognitive abilities
brain imaging. See neuroimaging	genetics of, 552, 561–562, 588
brain maintenance, 35, 205–206	candidate gene influences, 554–556, 557
brain reserve, 33–35, 38, 90–91	epigenetic mechanisms, 559–561
brain reserve capacity (BRC), 424–425, 430–432	gene-environment interactions, 558–559
brain stimulation, for late-life depression,	heritability, 552–554
601–602	polygenic scores in increasing predictive
brain training. See cognitive training	power, 556–558
brain-derived neurotrophic factor (BDNF) gene,	initial level of, 690–691
555, 556, 557	interventions improving, 685–687, 692
BRC. See brain reserve capacity	cognitive aging models, 5, 22
broad learning, 688–689	
broaden-and-build theory, 355	common cause model of sensory and cognitive function, 5–6
Butler, Robert, 385	compensation-related utilization of
Butter, Robert, 365	*
CA1 69 72	neural circuits hypothesis (CRUNCH),
CA1, 68–73	12, 64–65, 169
CA3, 68–73	debates in
caloric restriction, 620	domain-general <i>versus</i> domain-specific
candidate gene studies, of cognitive abilities,	age-related changes, 19–21
554–556, 557	limitations of models and methodological
capacity sharing model, of cognition and	advances, 21–22
mobility, 706	hemispheric asymmetry in older adults
cardiovascular disease, 432. See also	(HAROLD), 12–13, 64–65
cerebrovascular disease	STAC, 16–19, 64–65, 122
cardiovascular fitness	cognitive reserve and, 42
cognitive aging association with, 444–445	revised model of, 16–18, 122–123
episodic memory improvement with, 208–209	cognitive behavioral therapy for insomnia
care coordination approaches, for late-life	(CBT-I), 636–637
depression, 599	cognitive change, emotion regulation and,
cataracts, 188	307–308



746 Index

cognitive control, of strategic variations during experimental methods for study of, 401-403 framework of, 401 cognitive aging, 135 behavioral data, 135-137 mechanisms underlying, 409-410 brain-imaging data, 137-139 other applied implications of, 408 cognitive deliberation, in decision making participant factors moderating, 406-407 age-related differences in, 219-221 vision loss demands on, 189-190 interventions supporting, 224 well-being and, 532-533, 545, 589 cognitive engagement interventions, 685-686, age, gender, and education role in, 540-541 health behavior role in, 537-538 692-693, 740 cognitive training compared with, 686-687, individual resources and constraints in, 540-542 marital status role in, 543-544 outcomes maximization in neurobiological pathways linking, 539-540 via optimal individualized approach, 689-692 pathways linking, 536-539 perceived control role in, 542 via optimal scientific approach, 687-689 research overview for, 685-687 physical health role in, 541-542 cognitive function secular trends role in, 544-545 awareness of aging and, 522-524 social participation role in, 538-539 bilingualism and, 482-483 sociohistorical context resources and conblood biomarkers of healthy, 571-572, 573 straints in, 542-545 control beliefs and, 516-517, 519-520, stressor reactivity role in, 537 522-524 well-being as antecedent for cognitive cultural influences on, 459-460 function and development, 535-536 aging effects on, 466-467 well-being as outcome of cognitive function perception and attention, 460-461 and development, 533-535 semantic and mathematical processing, cognitive mechanics, 219 461-462 cognitive permeation hypothesis, 6 social mores, affective reactions, and cognitive remediation, for late-life depression, self-concept, 462-463 emotion recognition deficits with decline of, cognitive reserve (CR), 32, 42-43, 121-123 370 in Alzheimer's disease, 32-33, 34, 35, 36-37, grit role in, 506-508 39-40, 424-425, 430-432 hearing loss demands on, 184-186 bilingualism advantages for, 485 intraindividual variability in, 518, 519-520 brain reserve and, 33-35, 38 late-life depression and, 595-596 concept of, 32-33 major neurotransmitter systems involved in, episodic memory performance and, 205-206 83-86 evidence for acetylcholine, 83, 85-86 cognitive, 38 dopamine, 83, 84, 85 epidemiologic, 37-38 glutamate and GABA, 83 neuroimaging, 38-40 noradrenaline, 83, 84, 85 grit role in, 506-507 mobility interrelationship with, 704-708 locus coeruleus neuron density and, 90-91 nutrition role in, 612-613, 620-621, 738 measurement of, 34, 40-41 antioxidants, 614-615 neural correlates of, 40-41 B vitamins, 613-614 STAC and, 42 dietary patterns, 618-620 technology support for, 718 fruits and vegetables, 617-618 theoretical issues in, 40-41 polyunsaturated fatty acids, 617 theory predictions of vitamin D, 616 in Alzheimer's disease, 36-37 in healthy aging, 37 vitamin K, 615-616 prenatal influences on, animal models of, cognitive reserve capacity (CRC), 424-425, 425-427 430-432 stereotype threat impacts on, 400-401, 410, cognitive strategy, 127-128. See also strategy 420 perspective clinical implications of, 407-408 cognitive structure, in neuroadaptive aging, deficit expectations role in, 403-404 73-74 domains most affected by, 404-406 cognitive training



Index

cognitive engagement compared with,	continuing care retirement communities
686–687, 693	(CCRCs), technology use in, 729–730
duration of, 677	continuous positive airway pressure (CPAP), 637
far transfer of, 666–668, 676–678, 737–738	control beliefs, 514, 524, 589
distraction suppression hypothesis of,	aging effects on, 516
670–675, 676–678	awareness of aging, 520-524
durability of, 675–676	construct of, 514–516
mechanism considerations in, 668	control beliefs, 522–524
updating hypothesis of, 668–670, 675, 676–678	developmental and contextual approaches to, 518–520
mobility intervention using, 708	individual differences in, 516–517, 519–520
plasticity effects of, 53–55	intraindividual variability in, 518,
studies of, 451–452	519–520
cold cognition, 332	perceived control, 521–522
collaborative inhibition, 284	coordinate response measure (CRM) task, 184
age differences in, 284–286	coping, 500–501
in long-term married couples, 286–288	cortical thinning, sleep role in, 632–633
collaborative memory, 418	cortisol, 340–341
group-level measures of, 282–283	CPAP. See continuous positive airway pressure
individual-level measures of, 282, 283–288	CR. See cognitive reserve
study approaches to, 282, 288	CRC. See cognitive reserve capacity
compensation	CREATE model, 720
in arousal neurotransmitters, 101, 102, 104,	critical periods, 589
110–111, 123	for activity participation, 448, 449–450
acetylcholine, 103, 105–106	CRM task. See coordinate response measure task
dopamine, 102, 105, 109	crystalized intelligence
histamine, 103, 105, 109–110	in decision making, 221
norepinephrine, 102, 104–110 orexin, 103–104, 105, 109	heritability of, 552–554 cultural influences, 457–459, 588–589
overarousal, 101, 106–110	cognitive differences between Westerners and
serotonin, 102–103, 105, 109	East Asians, 459–460
underarousal, 101, 104–106	aging effects on, 466–467
grit role in, 507–508	in object- and context-focused perception
for sensory decline, 162–169, 273–274	and attention, 460–461
top-down, 162–169, 273–274	in semantic and mathematical processing,
compensation models, 12–13, 122–123	461–462
compensatory scaffolding, in STAC model,	in social mores, affective reactions, and
16–19, 122	self-concept, 462–463
competence, 515–516	evidence for, 466–467
computerized cognitive remediation, for late-life	as lifetime of integrating social norm violations
depression, 601 COMT gene. See catechol-O-methyltransferase	and informative signals of informativeness, 469–470
gene	neural correlates of, 463
conceptual self, 388	biases in neural selectivity and
conformity, memory, 288–289, 292–293	specialization, 463–464
age differences in susceptibility to,	extra-recruitment for culturally
289–291	nonpreferred strategies, 464–465
perceptions of age and, 291–292	predictive coding view of, 467–469
conscientiousness, 503	sense of control and, 517
conservative social attitudes, 368–369	
consistency of interest, 503, 505, 506	DAN. See dorsal attention network
consolidation, memory	dark adaptation, 188
emotion role in, 237–238, 241–243	DASH. See Dietary Approaches to Stop
sleep role in, 632, 633	Hypertension
constraints, 515	de Beauvoir, Simone, 384–385
context-focused perception and attention,	DECHA. See default-executive coupling
460–461	hypothesis of aging



748 Index

decision making developmental plasticity, 424 age-related differences in, 218-219, 225-226, DG. See dentate gyrus 273-274, 276 diet, 618-620 for late-life depression, 603 cognitive deliberation and motivation and. 219-221 Dietary Approaches to Stop Hypertension emotion and motivation and, 222-224 (DASH), 618-620 experience-based knowledge and, 221-222 differential preservation, in activity-cognition interventions supporting, 224 associations, 446-448, 588 cognitive deliberation and motivation, 224 digital home assistants, 725 emotion and motivation, 225 dimensionality, of cognitive aging, 48 discourse processing, 492 experience-based knowledge, 225 strategy use in, 130-131 distraction suppression hypothesis, 149-150, DED. See depression with executive dysfunction 670, 675, 676–678 dedifferentiation, 13-14 evidence supporting, 670-672 Deese-Roediger-McDermott (DRM) paradigm, perceptual training and, 672-675 405-406 divided attention, time perception and, 259-260, default mode network (DMN) 266 DMN. See default mode network in distraction suppression hypothesis, 670, 671-672 dmPFC. See dorsomedial prefrontal cortex failed suppression of DNA methylation, cognitive abilities and, attention effects, 164-165 559-561 domain-general age-related changes, 19-21 in brain-based models of aging, 14-15 in late-life depression, 597-598 domain-specific age-related changes, 19-21 default-executive coupling hypothesis of aging dopamine (DECHA), 15 age effects on, 86–87 deficit expectations, 403-404 in age-related working and episodic memory deletion inhibitory mechanism, 148, 150-151 decline, 83, 84, 85, 87-90 in arousal, 102, 105, 109 age-related differences in, 219-221 in attention, 171-172 interventions supporting, 224 in cognition, 83, 84, 85 dementia, 702. See also Alzheimer's disease dorsal attention network (DAN), in distraction blood biomarkers in, 570, 573-577 suppression hypothesis, 670, cognitive reserve and, 32-33, 34, 35, 39-40, 671-672 424-425, 430-432 dorsomedial prefrontal cortex (dmPFC), 245-247, 597 decision making and, 226 fetal programming of, 430-432 driving grit impact on, 508 age-related changes affecting, 190 hearing deficits and, 186 technology support for, 718 mobility in, 705-706 DRM paradigm. See Deese-Roedigermobility interrelationship with, 704-706 McDermott paradigm perceptual training impact on risk of, 675-676 dual-process models physical activity impact on, 646, 648, 660 of cognition and mobility, 706 social relationships in risk for, 356 of decision making, 219 of episodic memory, 8-9, 200-201 hypothesized mechanisms of risk reduction, 356-357 duration judgments, age-related declines in, 257 limitations of research on, 359 divided attention deficits, 259-260 loneliness and social isolation, 358-359 internal clock slowing, 258-259 social activities and support, 357-358 methodological considerations, 257-258 social networks, 357 time acceleration effects in, 265 dementia with Lewy bodies, 107 Dylan, Bob, 62 dentate gyrus (DG), 68-73 depression. See late-life depression early influences, cognitive aging and, 49-51 depression with executive dysfunction (DED), East Asians, cognitive differences between 593, 595-596, 603-604 Westerners and, 459-460 detached reappraisal, in emotion regulation, aging effects on, 466-467 307-308 in object- and context-focused perception and developmental goals, 334 attention, 460–461



Index

in semantic and mathematical processing,	response modulation, 308-309
461–462	situation selection and modification, 305
in social mores, affective reactions, and	improvement or stability of, 309-310
self-concept, 462-463	positivity effects in, 301–302, 342
ecological validity, in emotion recognition	socioemotional selectivity theory and, 301
difficulties, 371–372	theoretical models of
ecosystem focused therapy, 599-600	SAVI, 303-309
education	SOC-ER, 302-303, 304-309
in cognitive function-well-being association,	in time perception, 262–263
540–541	emotional tagging hypotheses, 241–242
cognitive reserve and, 34, 36–38, 39	emotional well-being, 299-300
intervention optimization and, 690-691	social relationships in, 315, 324
stereotype threat moderation by, 406	aging effects on social interactions, 318–323
EEG. See electroencephalography	relationship maintenance in health
ego integrity, 392	preservation, 315–318
electroencephalography (EEG), 182, 205-206,	empathic accuracy, 372
207, 208, 601, 671	encoding, memory
sleep studies, 629–631	age-related changes in, 201-204, 205, 206,
strategy execution studies, 134–135	207–208
strategy repertoire studies, 129–130	age-related memory deficits due to, 9, 10-11
emotion	collaborative inhibition and, 286–288
aging-related changes in experience of,	emotion role in, 236-237, 238-241
299–300	object- and context-focused perception and
attention and, 169-171	attention in, 460–461
in decision making	self-concept and, 318-319
age-related differences in, 222-224	sleep apnea and, 634-635
interventions supporting, 225	stereotype threat impact on, 404–406, 409–410
in memory, 236, 247, 273–274, 276	Engage, for late-life depression, 600–601
age-by-valence interactions, 236-238,	engagement. See also cognitive engagement
239–240, 243–247	interventions
as aid at time of learning, 237, 238-241	activity participation interventions, 451–452
changes in feeling of remembering,	cognitive function effects of, 351–352
243–247	dementia risk and, 357–358
as prioritization signal over periods of rest,	social
241–243	cognitive aging association with, 445-446
stereotype threat impact on, 404-406	cognitive function effects of, 351–352
noradrenergic response to, 84, 91	dementia risk and, 357-358
social network contribution to, 355	technology support for, 723-724
Westerner and East Asian differences in,	for vascular and late-life depression, 603
462–463	environmental factors
emotion recognition, age-related deficits in, 320,	in cognitive aging, 1–2, 49, 51–55
367, 376, 419	genetic correlations with, 558-559
brain changes in, 372–376	genetic interactions with, 558
ecological validity in, 371–372	social enrichment, 351–352, 354–355
gaze patterns in, 370–371	work, 354–355
general cognitive decline role in, 370	environmental support
positivity bias in, 369–370	compensation using, 165
studies of, 367–369	of episodic memory, 205
emotion regulation, 299, 418	self-initiated processing and, 10-11
in decision making, 223	technology design and, 730-731
emotional well-being and, 299-300	epigenetics
empirical support for theoretical models of,	of cognitive abilities, 559–561
304	prenatal influences on, 432
attentional deployment, 306-307	episodic memory
cognitive change, 307–308	age-related decline of, 200–201, 207–209,
process model of emotion regulation	273–274, 275–276
overview, 304	individual differences in, 205–207



750 Index

episodic memory (cont.) experience-based knowledge, in decision making interventions for, 208-209 age-related differences in, 221-222 neural contributions to, 201-205 interventions supporting, 225 binding deficits in, 9-10 expressive suppression, in emotion regulation, 308-309 change trajectories of, 47-48 definition of, 200 extra-recruitment, for culturally nonpreferred dual-process model of, 8-9, 200-201 strategies, 464-465 grit impact on, 506-507 eyewitness memory, 408 heritability of, 552-554 KIBRA gene in, 555-556 face recognition, 464 in middle age, 206 facial expression neurotransmitter role in, 82-83, 87, 93-95, 123 cultural influences on, 462-463 acetylcholine, 83, 85-86, 92-93 recognition of, 367-368, 370-371, 372-373 dopamine, 83, 84, 85, 87–90 facilitation, in interference resolution, 204-205 noradrenaline, 83, 84, 85, 90-92 false memories, 405-406 personal past recall and, 389-390 familiarity physical activity impact on, 647-651, 657, in dual-process model of episodic memory, 658-660 8-9 200-201 recollection deficits in, 8-9 stereotype threat impact on, 404-406 self-initiated processing deficits in, 10-11 famine, 428-430 stereotype threat impact on, 404-406, 407 far transfer, of cognitive training, 666-668, strategy use in, 128-129, 130-132, 134 676–678, 737–738 tests of, 200-201 distraction suppression hypothesis of, Erikson's theory of development, 384, 391-392 670-675, 676-678 ERPs. See event-related potentials durability of, 675-676 ethnicity, intervention optimization and, 691-692 mechanism considerations in, 668 event-related potentials (ERPs), 134, 205, updating hypothesis of, 668-670, 675, 462-463, 465, 492, 673-674, 675-676 676-678 fat mass and obesity (FTO)-associated gene, 51 strategy repertoire studies, 129-130 sustained attention studies, 163 fetal exposures, 428-430, 432-433 excitatory neurotransmitters, 83 fetal programming executive dysfunction, depression with. See brain, 424 depression with executive dysfunction dementia risk, 430-432 executive functioning, 38, 83, 88-90, 92, 93, 122, FGA. See flexible goal adjustment 219, 322, 324, 340, 389, 428, 430, financial literacy, 221-222 507-508, 516-517, 572, 668-670, financial management, 724 671-672, 705, 707-708, 710 first impressions, 321-322 bilingualism impact on, 481, 485, 587-588 flexible goal adjustment (FGA), 501, 503-504, cognitive intervention outcomes and, 690-691 505 depression with changes in, 593, 595-596, fluid intelligence in decision making, 219-220, 221 603-604 genetic influences on, 555, 556, 557 emotion recognition difficulties and, 370 mobility and, 704 heritability of, 552-554 Flynn effect, 51-52, 53-54 nutrition impact on, 615-616 fMRI. See functional magnetic resonance physical activity impact on, 646, 647-648, 651-657, 658-661 imaging exercise folate, 613-614 in Alzheimer's disease, 646 food groups, 617-618 cognitive aging association with, 444-445 Framingham Stroke Risk Profile, 595 free recall, 404-406 cognitive reserve and, 34, 37-38 episodic memory improvement with, 208-209 frontal aging hypothesis, 204 genetic interactions with, 558 fruit consumption, 617-618 motivation for, 690 FTO-associated gene. See fat mass and physical activity compared with, 646-647 obesity-associated gene technology support for, 724-725 functional approach, to autobiographical memory in vascular and late-life depression, 603 age differences in use of personal past, Experience Corps, 690-691 387-388



More Information

Cambridge University Press 978-1-108-42834-7 — The Cambridge Handbook of Cognitive Aging Edited by Ayanna K. Thomas , Angela Gutchess Index

Index 751

identity support through recalling and narrating glymphatic system, 632, 633 personal past, 386-387 goal priorities, 338-339 functional connectivity, 38, 39-41, 67, 73-75, goal-directed attention, 162-165, 273-274 88-90, 151-152, 154, 164-165, 204-205, cost of compensation with, 165-169 207, 374, 375, 672 motivation and emotion influences on, 169-171 in distraction suppression hypothesis, 670, 671-672 goals in late-life depression, 593, 596-598 benefits and costs of pursuing, 333-334, functional independence, interventions 339-342 maintaining, 685-687, 692 in cognitive function, 332-334, 342-343, 418 shifts in goal priorities, 338-339 functional magnetic resonance imaging (fMRI), social-cognitive goals, 334-336 13-14, 22 cognitive reserve, 40-41 socioemotional goals, 336-338 distraction suppression hypothesis, 671, 675 definition of, 333 flexible adjustment of, 501, 503-504, 505 episodic memory impairments, 201-204, 205-206 motivation to, 333-334 LC-NE system, 107 tenacious pursuit of, 501, 503-504, 505 network dynamics and cognitive structure, in time perception, 262, 265 graph theory, in late-life depression, 597-598 neurotransmitter systems in cognitive aging, gray matter, cognitive training effects on, 54 82-83 grit acetylcholine, 92-94 achievement association with, 501-502 dopamine role, 87-90, 93 measurement of, 502-503 noradrenaline, 90-92, 93 in successful aging, 499-500, 508, 589 self-referential memory, 319 association between, 504-508 sleep impact on neurocognitive functions, concept of grit, 499-500, 501-504 concept of success, 499-501 632 - 633strategy execution studies, 134-135 variability in, 505 functional plasticity of aging hypothesis, 671 group level, collaborative memory at, 282-283 fusiform face area, 464 guided autobiography (GAB), 385 gustation, 190-191 GAB. See guided autobiography GABA. See gamma-aminobutyric acid hair cell loss, 181 GABAergic neurons, molecular plasticity and, head circumference, 427-428 71 - 72health behaviors, in cognitive gait, 703, 704-705, 707-708 function-well-being association, gamma-aminobutyric acid (GABA), 83, 171-172 gaze patterns, in emotion recognition, 370-371 healthcare, technology support for, 724-725 gender, in cognitive function-well-being assohealthy aging. See successful aging ciation, 540-541 age-related deficits in, 179-181 gene expression molecular plasticity and, 68-71 auditory sensitivity, 181 cognitive demands during speech underprenatal influences on, 432 generativity, 391-392 standing, 184-186 in cognitive function and dementia, 186 genetics of cognitive abilities, 552, 561-562, 588 intelligibility of speech in noise, 183 candidate gene influences, 554-556, 557 sound source localization, 182-183 epigenetic mechanisms, 559-561 spatial release from masking, 183-184 gene-environment correlations, 558-559 temporal processing, 181-182 gene-environment interactions, 558 in sensory deficit hypothesis, 5-6 heritability, 552-554 heart rate monitors, physical activity studies with, polygenic scores in increasing predictive 661 power, 556-558 heritability, of cognitive abilities, 552-554 cognitive aging and, 49-51, 552 hippocampus gist-based processes, 335, 389 cholinergic innervations of, 85-87, 92 glucose metabolism, 571-572 in episodic memory, 201-203 glutamate, 83 in memory retrieval, 245-246



752 Index

hippocampus (cont.) suppression of irrelevant distraction, molecular plasticity and, 68-73 149-150 histamine, 103, 105, 109-110 sustained activation, 150-151 historical context, in cognitive circadian rhythm effects, 154 function-well-being association, episodic memory impairment, 204-205, 208 542-545 mood effects, 154 homecare robots, 726 sustained activation in, 150-151 homocysteine, 613-614 unanticipated findings of, 153 homovanillic acid, 109 insomnia, 636-637 hot cognition, 332 integrated process model, of stereotype threat, 409-410 HPA axis. See hypothalamic-pituitary-adrenal integrative meaning, 389 intelligence. See also crystalized intelligence; hyper-binding, 153, 204-205 hypnotic medications, 638 fluid intelligence cognitive reserve and, 34, 40-41 hypocretin, 103-104 hypothalamic-pituitary-adrenal (HPA) axis, fetal emotion recognition difficulties and, 370 programming of, 431 intensity, physical activity, 651-658 interactive expertise, 286-288 identity, personal past role in, 383, 393, interaural level differences (ILDs), 182-184 419-420 interaural time differences (ITDs), 182-184 age differences in use of, 387-388 interference resolution, 204-205, 208 autobiographical memory in integration of, intergenerational programs (IGP), 740 388-390 intermittent theta burst stimulation (iTBS), for functional approach to, 386-388 late-life depression, 601-602 historical perspective on, 384-386 internal clock slowing, 258-259 identity support through recall and narrative, internal representations, 164-165 386-387 intervention, 737-741. See also cognitive life story in, 390-392 engagement interventions; cognitive IEGs. See immediate-early genes training IGP. See intergenerational programs activity components of, 687 ILDs. See interaural level differences activity participation, 451-452 immediate-early genes (IEGs), 70-71 collaborative, 284-286 inappropriate behavior, recognition of, 368-369 decision making, 224 inappropriate remarks, 322 cognitive deliberation and motivation, individual level, collaborative memory at, 282, 224 283 - 288emotion and motivation, 225 inflammation experience-based knowledge, 225 blood biomarkers of, 572, 575-576 goals of, 685-687, 692 in late-life depression, 595 initial cognitive abilities in, 690-691 information degradation hypothesis, 163-164 for late-life depression inhibition. See also inhibitory theory/inhibitory approaches to vascular depression, 599-600 deficit hypothesis computerized cognitive remediation, 601 access inhibitory mechanism, 148, 149-150 exercise and lifestyle interventions, 603 collaborative, 284 noninvasive brain stimulation, 601-602 age differences in, 284-286 psychotherapy, 600-601 in long-term married couples, 286-288 learning in, 687, 688-689 distraction suppression hypothesis and, 670 mobility, 708-709 of socially undesirable behavior, 322 motivation in, 689-690 inappropriate remarks, 322 multimodal, 709, 710 prejudice, 322-323 outcomes maximization in, 740 inhibitory neurotransmitters, 83 via optimal individualized approach, inhibitory theory/inhibitory deficit hypothesis, 689-692 7-8, 147, 154-155, 273-275 via optimal scientific approach, 687-689 activation in, 147-149, 150-151 person-to-person variation in, 689-692, 740 assumptions and predictions of, 147-148 prenatal, 433 automatic activation, 147-149 resource level in, 691-692 restraint of strong responses, 151-152 social factors in, 692



More Information

Cambridge University Press 978-1-108-42834-7 — The Cambridge Handbook of Cognitive Aging Edited by Ayanna K. Thomas , Angela Gutchess Index

Index 753

participation in, 440-442, 448, 452-453 targets of, 692-693 activity type and timing, 449–450 theory-driven, 689 differential preservation versus preserved cognitive function effects of, 352-353 differentiation in, 446-448, 588 dementia risk and, 358-359 intervention based on, 451-452 iTBS. See intermittent theta burst stimulation mental, 442-444 ITDs. See interaural time differences physical, 444-445 item memory, 10, 404-406 retrospective methods for study of, 448-449 item recognition tests, 200-201 social, 445-446 start of participation, 450-451 levodopa, 82-83, 87-88, 90 James, William, 386-387 Jung, Carl, 384 life course perspective, 1, 121-123, 333 activity participation considerations, 448 ketogenic diet, 620 activity type and timing, 449-450 kidney- and brain-expressed protein (KIBRA) retrospective methods for study of, 448-449 gene, 555-556 start of participation, 450-451 cultural influences in, 469-470 prenatal influences, 423-424 language processing animal studies of, 425-427 aging-related effects on, 491 cognitive reserve capacity, 424-425, discourse processing, 492 working memory and syntactic processing, 430-432 fetal brain programming, 424 491-492 bilingual human studies of, 427-430 auditory processing, 488-490 well-being role in, 532-533, 589 cognitive aging impact on, 481-482 life review, 385 cognitive function impact on, 482-483 life story, 390-391, 393. See also narrative higher-level processing, 491 identity transmission deficit theory and, 483-485 adult development and, 391-392 Westerner and East Asian differences in, historical perspective on, 384-386 461-462 lifestyle. See also activity participation late-life depression (LLD), 593, 603-604, in cognitive aging, 1-2 739 genetic interactions with, 558 clinical features of vascular and late-life depression interventions clinical phenotype, 594 targeting, 603 executive dysfunction, 595-596 lifetime appreciation, 261 in socioemotional selectivity theory, pathways to, 594-595 neurobiology of 261-264 altered structural and functional connectivlight exposure therapy, 637-638 ity, 596-597 light physical activity (LPA), 652-655, novel neuroimaging approaches to, 597-598 657 - 658limited time mechanism, of processing speed white matter hyperintensities, 596-597 effects on cognitive processes, 7 lipid metabolism, 571-572, 576-577 approaches to vascular depression, 599-600 computerized cognitive remediation, 601 LLD. See late-life depression LoC. See locus of control exercise and lifestyle interventions, 603 noninvasive brain stimulation, 601-602 locus coeruleus psychotherapy, 600-601 age-related changes in, 86, 90-91, 94-95 LC-NE system. See locus coeruleus-norepiin arousal, 102, 104-110 nephrine system tau pathology in, 94-95, 104 learning locus coeruleus-norepinephrine (LC-NE) system in cognitive interventions, 687, 688-689 age-related decline in, 104-106 emotion as memory aid in, 237, 238-241 compensatory increases in, 106-110 reprioritization of information in memory after, locus of control (LoC), 514-516, 519-520 241-243 loneliness social network impact on, 354-355 cognitive function effects of, 352-353 leisure activities dementia risk and, 358-359 cognitive reserve and, 34, 37-38 health effects of, 315



754 Index

low birth weight, 427-428 age-by-valence interactions in, 236-238, 239-240, 243-247 LPA. See light physical activity associative, 9-10 autobiographical, 383, 393 magnetic resonance imaging (MRI). See also functional magnetic resonance imaging cultural influences on, 462-463 functional approach to, 386-388 neurotransmitter systems in cognitive aging, 82-83 identity and memory integration through, prenatal influences on cognitive aging, 389-390 427-428, 429-430 life story and, 390-392 strategy distribution studies, 131 collaborative, 418 group-level measures of, 282-283 strategy selection studies, 132 of vascular and late-life depression, 596-597 individual-level measures of, 282, magnetoencephalography (MEG), cognitive 283-288 control of strategic variations, 137-139 study approaches to, 282, 288 maintenance, brain, 35, 205-206 consolidation of marital status emotion role in, 237-238, 241-243 in cognitive function-well-being association, sleep role in, 632, 633 543-544 control beliefs and, 516-517, 518-520 dementia risk and, 357, 358 emotion role in, 236, 247, 273-274, 276 markers. See also blood biomarkers age-by-valence interactions, 236-238, of prenatal stress, 427-428 239-240, 243-247 married couples, collaborative inhibition in, as aid at time of learning, 237, 238-241 286-288 changes in feeling of remembering, 243-247 masking, spatial release from, 183-184 as prioritization signal over periods of rest, maternal stress, cognitive aging relationship to, 241-243 432-433 stereotype threat impact on, 404-406 animal models of, 425-427 encoding of human studies of, 427-430 age-related changes in, 201-204, 205, 206, 207-208 mechanisms underlying, 430-432 age-related memory deficits due to, 9, 10-11 strategy use in, 128-132, 133-135 collaborative inhibition and, 286-288 Westerner and East Asian differences in, emotion role in, 236-237, 238-241 461-462 object- and context-focused perception and Matthew effects, 690-691 attention in, 460-461 MCI. See mild cognitive impairment self-concept and, 318-319 sleep apnea and, 634-635 MCR. See motoric cognitive risk syndrome meaning, integrative, 389 stereotype threat impact on, 404-406, MeDi. See Mediterranean-type diet 409-410 medial prefrontal cortex (mPFC), 15, 84, 102, epigenetic mechanisms in, 560-561 319, 373, 597 eyewitness, 408 dorsomedial, 245-247, 597 gist-based processes in, 335 in emotion recognition, 373, 374-376 grit impact on, 506-507 heritability of, 552-554 positivity effect and, 239-240 item, 10, 404-406 self-reference effect and, 237, 240 ventromedial, 246, 373 prenatal influences on, animal models of, medial temporal lobe (MTL), 9, 14, 16, 54, 425-427 65-67, 72, 201-204, 276, 485-486, prospective, 404-406 587-588 retrieval of medication management, 725-726 age-related changes in, 200-205, 206, Mediterranean-type diet (MeDi), 618-620 207-208 Mediterranean-DASH Intervention for age-related memory deficits due to, 8-11 Neurodegenerative Delay (MIND), with arithmetic, 130-131 618-620 collaborative memory and, 282-283, 284, MEG. See magnetoencephalography melatonin, 638 distraction suppression hypothesis and, 670 memory. See also episodic memory; working emotion role in, 238, 243-247 neurotransmitter impact on, 91



Index

object- and context-focused perception and	motivation
attention in, 460-461	attention and, 169–171
role of inhibition at, 147, 151, 152	benefits and costs in, 333-334, 339-342
self-memory system and, 388	in cognitive engagement interventions,
stereotype threat impact on, 404-406	689–690
sleep role in, 632, 633	in cognitive function, 332–334, 339–343, 418
social context role in, 336	in decision making
in social contexts, 281-282, 293	age-related differences in, 219-221,
collaborative memory, 282-288, 418	222–224
social contagion/memory conformity,	interventions supporting, 224, 225
288–293, 418	factors influencing, 333–334
social-cognitive goals role in, 334–336	motoric cognitive risk syndrome (MCR), 707
source, 200–201, 404–406	mPFC. See medial prefrontal cortex
stereotype threat impact on, 404–406, 407, 408	MRI. See magnetic resonance imaging
transactive, 286–288	MTL. See medial temporal lobe
Westerner and East Asian differences in,	multilingualism, 481
460–461	multimodal intervention, 709, 710
memory conformity, 288–289, 292–293, 418	multivariate pattern analysis (MVPA), episodic
age differences in susceptibility to, 289–291	memory studies, 207–208
age perception and, 291–292	multivoxel pattern analysis (MVPA), 13–14, 22
memory strategy, 11, 128–129, 130–132,	music, recognition of emotion in, 367–368
133–134	MVPA. See moderate-to-vigorous physical
mental activity, cognitive aging association with,	activity; multivariate pattern analysis;
442–444	multivoxel pattern analysis
mental health, social network impact on, 316–317, 351	myelination, deterioration of, 21
metabolism	naps, 638
blood biomarkers of, 571–572, 576–577	narrative foreclosure, 392
prenatal influences on, 432	narrative identity, 383, 393
sleep impact on, 631	adult development and, 391–392
mild cognitive impairment (MCI), 702	definition of, 390–391
blood biomarkers of, 570, 573–576	historical perspective on, 384–386
cognitive reserve and, 39–40	nCCR-GD. See neuroplasticity-based
grit impact on, 507	computerized cognitive remediation for
mobility in, 705–706	geriatric depression
nutrition role in, 612–613	negative affect, aging-related changes in
orexin levels in, 109	experience of, 299-300. See also emotion
MIND. See Mediterranean-DASH Intervention	regulation
for Neurodegenerative Delay	negative information
mind-wandering, 164–165	age-related responsiveness to, 169–171
mitochondrial dysfunction, 430–431	decision making and, 222–223
blood biomarkers of, 571–572, 575–576	network dynamics, in neuroadaptive aging,
mobility, 701–702, 709–710, 739	73–74
aging-related changes in, 702–704	Neugarten, Bernice, 384–385
aging-related cognitive changes impacting,	neural networks
701–702	age differences in recruitment of, 12–13
cognitive decline interrelationship with,	cognitive reserve and, 39–40, 42
704–708	cultural biases in, 463–464
cross-domain model of cognition and, 706	dedifferentiation and, 13–14
interventions for, 708–709	default mode
measurement of, 703–704	in attention, 164–165
moderate-to-vigorous physical activity (MVPA),	in brain-based models of aging, 14–15
651–657	in distraction suppression hypothesis, 670,
molecular plasticity genes and functional pathways in, 68–71	671–672 in enisodic memory 201, 204, 207
synapses, systems, and circuits in, 71–73	in episodic memory, 201–204, 207 extra-recruitment of, for culturally
mood, inhibitory theory and, 154	nonpreferred strategies, 464–465
mood, minoriory dicory and, 134	nonpresented strategies, 404-403



756 Index

neural networks (cont.) strategy execution studies, 134-135 in late-life depression, 596-598 strategy repertoire studies, 129-130 molecular plasticity and, 71-73 strategy selection studies, 132 transmission deficit theory, 484-485 in neuroadaptive aging, 71-73 of vascular and late-life depression, 596-598 recruitment of alternate, 121-122 neuromelanin, 86, 90-91 reorganization of, 73-74 in STAC model, 16-19 neuromodulators, 83 neural reserve, in locus coeruleus, 90-91 in attention, 171-172 neural resource depletion, 16-18, 122-123 neuroplasticity. See plasticity neural resource enrichment, 16-18, 122-123 neuroplasticity-based computerized cognitive neural selectivity and specialization, cultural remediation for geriatric depression biases in, 463-464 (nCCR-GD), 601 neuroadaptive aging, 62, 63-64, 74-75, 76, 123 neuropsychological assessment animal models of, 67-68 blood biomarkers with, 569, 570 conceptualization of, 64-67 stereotype threat impact on, 407-408 perspectives on growing older and, 62 neurotransmitters substrates of age effects on, 86-87 arousal-related, 101, 102, 104, 110-111, 123 genes and functional pathways in molecular acetylcholine, 103, 105-106 plasticity, 68-71 dopamine, 102, 105, 109 network dynamics and cognitive structure, histamine, 103, 105, 109-110 synapses, systems, and circuits in molecular norepinephrine, 102, 104-110 plasticity, 71-73 orexin, 103-104, 105, 109 neurodegenerative disease. See also dementia overarousal with aging, 101, 106-110 blood biomarkers in, 570, 573-577 serotonin, 102-103, 105, 109 neurodevelopment, cognitive aging impact of, underarousal with aging, 101, 104-106 in attention, 171-172 neuroimaging, 11, 48, 67, 572. See also specific co-release of, 94-95 definition of, 83 imaging modalities bilingualism, 488 in emotion recognition, 375-376 biomarkers, 574-575 major cognition, 83-86 cognitive control of strategic variations, acetylcholine, 83, 85-86 137-139 dopamine, 83, 84, 85 glutamate and GABA, 83 cognitive reserve evidence provided by, 38, 40-41 noradrenaline, 83, 84, 85 brain function, 39-40 in working and episodic memory decline, brain structure, 39 82-83, 87, 93-95, 123 acetylcholine, 83, 85-86, 92-93 compensatory processes, 165-167 culture-related biases in neural selectivity and dopamine, 83, 84, 85, 87-90 specialization, 463-464 noradrenaline, 83, 84, 85, 90-92 nighttime awakenings, 629-630 distraction suppression hypothesis, 670-672 emotion recognition, 374-376 noise, speech perception in, 183, 673 emotion regulation, 262-263 noradrenaline (norepinephrine) epigenetic mechanisms, 561 age effects on, 86-87, 104-106 extra-recruitment for culturally nonpreferred in age-related working and episodic memory strategies, 464-465 decline, 83, 84, 85, 90-92 inhibitory theory, 151-152 in arousal, 102, 104-110 of motivational processes, 343 in cognition, 83, 84, 85 network dynamics and cognitive structure, compensatory increases in, 106-110 73 - 74NREM sleep, 629-631 object- and context-focused perception and Nun Study, 32-33 attention, 460-461 nutrition cognitive function effects of, 612-613, prejudice in aging, 322-323 self-referential memory, 318-319 620-621, 738 sleep studies, 632-633 antioxidants, 614-615 STAC and, 64-65 B vitamins, 613-614 strategy distribution studies, 131 dietary patterns, 618-620



More Information

Cambridge University Press 978-1-108-42834-7 — The Cambridge Handbook of Cognitive Aging Edited by Ayanna K. Thomas , Angela Gutchess Index

fruits and vegetables, 617-618

Index 757

perseverance of effort, 503, 504, 505, 506

personal past, in identity, 383, 393, 419-420 novel approaches to, 620 polyunsaturated fatty acids, 617 age differences in use of, 387-388 vitamin D, 616 autobiographical memory in integration of, 388-390 vitamin K, 615-616 prenatal functional approach to, 386-388 animal models of, 425-427 historical perspective on, 384-386 human studies of, 427-430 identity support through recall and narrative, 386-387 object-focused perception and attention, 460-461 life story in, 390-392 PET. See positron emission tomography occupational attainment, 34, 36-38 OFC. See orbitofrontal cortex PFC. See prefrontal cortex olfaction, 190-191 phototherapy, 637-638 omega-3 polyunsaturated fatty acids, 617 phylloquinone, cognitive function impact of, orbitofrontal cortex (OFC), 372-376 615-616 orexin, 103-104, 105, 109 physical activity (PA) others, understanding of, in aging effects on cognitive aging relationship with, 444-445, social interactions, 319-322 645-647, 658-661, 738 overarousal, in cognitive aging, 101, 106-110 intensity studies, 651-658 methods of studying, 647 oxidative stress, blood biomarkers of, 572, 575-576 overall activity level studies, 647-651 oxytocin, 375-376 definition of, 646-647 genetic interactions with, 558 PA. See physical activity mobility intervention using, 708-709 paired-associate learning, 200-201 motivation for, 690 paradox of emotion in aging, 299-300 objective assessment of, 647, 658-660, 738 parahippocampal place area (PPA), 151 technology support for, 724-725 Parkinson's disease, 63-64, 82-83, 168, in vascular and late-life depression, 603 574-576 physical health sleep disorders in, 635, 636 in cognitive function-well-being association, participation. See activity participation; social 541-542 social network impact on, 316-317, 351 engagement PASA. See posterior to anterior shift in aging technology support for, 724-725 PATH. See problem adaptation therapy plasticity pattern separation, noradrenaline role in, 91-92 aging effects on, 53-55 perceived competence (PC), 515-516 blood biomarkers of, 571-572 perceived constraints, 515 cognitive training and, 666-667 perceived control, 514-515. See also control developmental, 424 beliefs distraction suppression hypothesis and, 671 awareness of aging and, 521-522 life-span trajectory of, 63-64, 65-67, 74-75 in neuroadaptive aging, 62, 63-64, 74-75, 76, in cognitive function-well-being association, 542 123 perceived time, 254-255. See also time animal models of 67-68 perception conceptualization of, 64-67 perception. See also sensory perception; time genes and functional pathways in, 68-71 perception network dynamics and cognitive structure of age, social contagion and, 291-292 in, 73-74 cultural influences on, 460-461 perspectives on growing older and, 62 speech, 487-488 synapses, systems, and circuits in, 71-73 speech-in-noise, 183, 673 prenatal influences on, 431 perceptual learning, 672-675 perceptual training, 672-675, 676-677 PLMS. See periodic limb movements during dementia risk and, 675-676 sleep periodic limb movements during sleep (PLMS), polygenic scores, in cognitive ability predictions, 556-558 peripheral vision, in driving, 190 polysomnography (PSG), 629, 630 PERMA model of well-being, 720 polyunsaturated fatty acids (PUFAs), 617



758 Index

positive affect, aging-related changes in mechanisms underlying fetal programming of experience of, 299-300. See also emotion dementia risk, 430-432 preserved differentiation, in activity-cognition regulation associations, 446-448, 588 positive reappraisal, in emotion regulation, prevention focus, 409-410 307-308 positivity effect priming, 148-149 in age-by-valence interactions in memory, PRISM project, 730 236-238, 239-240, 243-247 proactive interference, 152 in attention, 169-171, 306-307 problem adaptation therapy (PATH), 600 in autobiographical memory, 389-390 problem-solving therapy (PST), 600 cultural influences on, 466-467 process model of emotion regulation, 304 in decision making, 222-223 attentional deployment, 306-307 in emotion recognition difficulties, 369-370 cognitive change, 307-308 in emotion regulation, 301-302, 342 response modulation, 308-309 in goal influences on cognitive function, situation selection and modification, 305 337-338 processing speed, 6-7 positron emission tomography (PET) change trajectories of, 47-48 arousal role in cognitive decline, 105 emotion recognition difficulties and, dopamine role in cognitive aging, 87-90, physical activity impact on, 647-651, 657, noradrenaline role in cognitive aging, 91 658-660 training of, 674-675 posterior parietal cortex, in episodic memory, 201-203 Project EVO, 601 posterior to anterior shift in aging (PASA), 12-13, promotion focus, 409-410 64-65 prospective memory, 404-406 in top-down compensation, 165-166 prudent diet, 619 post-stroke depression, 597 PSG. See polysomnography posture, 703 PST. See problem-solving therapy cognitive aging effects on, 704 psychotherapy, for late-life depression, PPA. See parahippocampal place area 600-601 predictive coding, 467-469 PUFAs. See polyunsaturated fatty acids prefrontal cortex (PFC). See also medial pupil size, LC-NE system activity and, prefrontal cortex in attention processing, 167-169, pupillometry studies, cognitive demands during speech understanding, 185-186 172 compensatory scaffolding in, 16 in emotion recognition, 373, 374-376 race, sense of control and, 516-517 in episodic memory, 203-205, 206 raclopride, 87-88 in memory retrieval, 245-247 RBD. See REM sleep behavior disorder molecular plasticity and, 73 reactive oxygen species (ROS), 572, 575-576 reading, 189-190 positivity effect and, 239-240 real-world skills, interventions improving, 688, pregnancy fetal brain programming during, 424 692-693 stress during, 432-433 reappraisal, in emotion regulation, 307-308 animal models of, 425-427 recollection human studies of, 427-430 in dual-process model of episodic memory, mechanisms underlying dementia risk due 8-9, 200-201 to, 430-432 stereotype threat impact on, 404-406 prejudice, 322-323 deficit of, 8-9 prenatal influences on cognitive aging, 423–424, redemption sequences, 391-392 432-433, 589 redemptive self, 391-392 life course perspective of, 423-424 regulation, emotion. See emotion regulation animal studies of, 425-427 regulatory focus theory, of stereotype threat, cognitive reserve capacity, 424-425, 409-410 430-432 REM sleep, 629-631 fetal brain programming, 424 REM sleep behavior disorder (RBD), human studies of, 427-430 635-636



Index

remembering, personal identity and, 383, 393	robots
functional approach to	assistive and homecare, 726
age differences in use of personal past,	social, 724, 725
387–388	rod photoreceptor loss, 188
identity support through recalling and	ROS. See reactive oxygen species
narrating personal past, 386–387	rPFC. See right prefrontal cortex
historical perspective on, 384–386	rTMS. See repetitive transcranial magnetic
reminiscence, 383, 393	stimulation
functional approach to	
age differences in use of personal past,	salivary alpha amylase, 108
387–388	SAVI. See strength and vulnerability integration
identity support through recalling and	SBP. See systolic blood pressure
narrating personal past, 386–387	scaffolding theory of aging and cognition
historical perspective on, 384–386	(STAC), 16–19, 64–65, 122
reminiscence bump, 390	
	cognitive reserve and, 42
repetitive transcranial magnetic stimulation	revised model of, 16–18, 122–123
(rTMS), 21–22	scopolamine, 85–86, 92–93
for late-life depression, 601–602	scotopic vision, 188
reserve. See brain reserve; cognitive reserve	secular trends, in cognitive function-well-being
resource-modulation hypothesis, genetic	association, 544–545
variability in, 554–555	selection, optimization, and compensation (SOC)
resources	model
intervention optimization and, 691–692	goal priorities and, 338
social network provision of, 355–356	of successful aging, 717–718, 721
response, restraint of strong, 151–152	selection, optimization, and compensation theory
response modulation, in emotion regulation,	of emotion regulation (SOC-ER),
308–309	302–303
rest, 241-243. See also sleep	empirical support for, 304
restless legs syndrome (RLS), 635	attentional deployment, 306-307
restraint inhibitory mechanism, 148, 151-152	cognitive change, 307–308
retrieval	process model of emotion regulation over-
memory	view, 304
age-related changes in, 200-205, 206,	response modulation, 308-309
207–208	situation selection and modification, 305
age-related memory deficits due to, 8-11	selective attention, 266
with arithmetic, 130–131	selective engagement, 333–334, 340–342
collaborative memory and, 282-283, 284,	selective engagement theory (SET), 340–342
286	selective norepinephrine inhibitors, 599
distraction suppression hypothesis and, 670	selective serotonin reuptake inhibitors, 599
emotion role in, 238, 243–247	self-concept, Westerner and East Asian
neurotransmitter impact on, 91	differences in, 462–463
object- and context-focused perception and	self-continuity
attention in, 460–461	personal past role in, 383, 393, 419–420
role of inhibition at, 147, 151, 152	autobiographical memory in integration of
self-memory system and, 388	identity and memory, 388–390
stereotype threat impact on, 404–406	functional approach to, 386–388
word, 483–485, 486	historical perspective on, 384–386
retrieval strategy disruption theory, 284, 286–288	life story, 390–392
retrospective studies, of activity-cognition	in time perception, 264
associations, 448–449	self-determination theory, 720
reverse causation, in activity-cognition	self-efficacy, 514–515
associations, 446–448, 588	self-initiated processing deficits, 10–11
reward processing, 598	self-memory system (SMS), 388–389
right inferior frontal gyrus (rIFG), 164	self-reference effect (SRE), 205, 237, 240-241
right prefrontal cortex (rPFC), 167-169, 172	self-regulation, 322
risk taking, 225–226	semantic priming, 148–149
RLS. See restless legs syndrome	semantic processing, 461–462



760 Index

senior technology acceptance model (STAM), SMS. See self-memory system SOC model. See selection, optimization, and sensitivity compensation model SOC-ER. See selection, optimization, and auditory, 181 spatial contrast, 187-188 compensation theory of emotion sensory deficit hypothesis, 5-6 regulation sensory perception, 179, 191, 275. See also social cognition, 315, 324, 419 auditory perception; visual perception social contagion, 288-289, 292-293, 418 age differences in susceptibility to, 289-291 bilingualism and, 482 compensation for, 162-165, 273-274 perceptions of age and, 291-292 cost of, 165-169 social context normal age-related changes in, 179 in aging-related memory decline, 336 taste, smell, and balance, 190-191 cognitive aging in, 417–420 training of, 672-675 in cognitive function-well-being association, variability in, 179 542-545 Westerner and East Asian differences in, in decision making, 226 460-461 intervention optimization and, 692 sequential strategy interference effects, 136-139 memory in, 281-282, 293 serotonin, 102-103, 105, 109 collaborative memory, 282-288, 418 SES. See socioeconomic status social contagion/memory conformity, SET. See selective engagement theory 288-293, 418 social engagement set-switching, physical activity impact on, 657 shared decision making, 226 cognitive aging association with, 445-446 Sister Mary, 32-33 cognitive function effects of, 351-352 situation modification, 305 in cognitive function-well-being association, situation selection, 305 538-539 dementia risk and, 357-358 situational goals, 333 size at birth, cognitive aging relationship to, technology support for, 723-724 427-428 for vascular and late-life depression, sleep, 628-629, 639, 739 aging-related changes in, 629-631 social integration theory, 354-355 deprivation, 633-634 social interaction, aging effects on, 318 neurocognitive functions of inhibition of socially undesirable behavior, in older adults, 632-634 322 - 323in young adults, 631-632 understanding of others, 319-322 normal, 629-631 understanding of self, 318-319 poor, 632-634 social isolation reprioritization of information in memory cognitive function effects of, 352-353 during, 242-243 dementia risk and, 358-359 sleep disorders, 634 social network, 315 insomnia, 636-637 aging-related decline in size of, 316 REM sleep behavior disorder, 635-636 dementia risk and, 357 restless legs syndrome, 635 diversity of relationships in, 360-361 sleep apnea, 634-635, 637 healthy aging through, 317-318 treatment of, 636 mechanisms of associations between, CBT-I, 636-637 353-356 CPAP, 637 physical and mental health implications of, light exposure therapy, 637-638 316-317, 351 napping, 638 positive emotion from, 355 pharmacological, 638 resources provided by, 355-356 sleep hygiene, 636 structure and behaviors of, 354-355 slow wave sleep (SWS), 629-631 variability in, 350-351 smartphones social norms health tracking on, 724-725 in cultural influences on cognitive aging, medication management with, 725-726 469-470 older adult use of, 719 Westerner and East Asian differences in, smell, 190-191 462-463



social relationships, 315, 324, 419

322-323

360-361

352-353

356-357

dementia risk and, 356

social networks, 357

maintenance of, 315-318

diversity of, 360-361

316

317-318

social robots, 724, 725

prejudice, 322-323

socioeconomic status (SES)

237, 240-241

239-240, 246-247

control beliefs and, 515

336-338

decision making and, 222

of emotion regulation, 301

of time perception, 261-262

goal selection, 262

self-continuity, 264

measurement of, 360

variability in, 350-351

inappropriate remarks, 322

aging effects on social interactions, 318

understanding of others, 319-322

cognitive function effects of, 350-351,

aging-related changes in selection of, 301

understanding of self, 318-319

mechanisms of, 353-356

inhibition of socially undesirable behavior,

More Information

span tasks, 150 spatial ability, 552-554 spatial contrast sensitivity, 187-188 spatial release from masking, 183-184 speech bilingualism impact on perception of, 487-488 cognitive demands during understanding of, 184-186 intelligibility of, 183 speech-in-noise perception, 183, 673 speed of processing model, 6-7 speed of processing training, 674-675 split effects, in arithmetic, 129-130 SRE. See self-reference effect SST. See socioemotional selectivity theory ST. See stereotype threat STAC. See scaffolding theory of aging and cognition STAM. See senior technology acceptance model stereotype threat (ST) cognitive performance effects of, 400-401, 410, 420 clinical implications of, 407-408 deficit expectations role in, 403-404 domains most affected by, 404-406 experimental methods for study of, 401-403 framework of, 401

sound source localization, 182-183

source memory, 200-201, 404-406

Index

761

dementia risk and, 356-359 social engagement effects, 351-352 social isolation and loneliness effects, hypothesized mechanisms of risk reduction, limitations of research on 359 loneliness and social isolation, 358-359 social activities and support, 357-358 aging-related decline in social network size, physical and mental health implications of social networks, 316-317, 351 social networks influences on healthy aging, mechanisms underlying, 409-410 social support, dementia risk and, 357-358 other applied implications of, 408 social-cognitive goals, 334-336 participant factors moderating, 406-407 socially undesirable behavior, inhibition of, 322 cultural variability in, 404 motivation and, 340 social contagion and, 291-292 stimulus-driven attention, 162-165, 273-274 cognitive function effects of, 354-355 strategy distribution, 128 intervention optimization and, 691-692 aging effects on, 130 sense of control and, 516-517 behavioral data, 130-131 socioemotional domains, emotional memory brain-imaging data, 131 benefits from processes shared across, strategy execution, 128 aging effects on, 132-133 socioemotional goals, 336-338 behavioral data, 133-134 socioemotional selectivity theory (SST) brain-imaging data, 134-135 in age-by-valence interactions in memory, strategy interference effects, 136-139 strategy perspective, 127-128, 139, 273-274 on age-related differences in cognitive control of strategic variations, goal-based influences on cognitive function, 135-139 in strategy distribution, 130-131 in strategy execution, 132-135 emotion regulation, 262-263 in strategy repertoire, 128-130 in strategy selection, 131-132 dimensions of, 128



762 Index

strategy repertoire, 128 social networks influences on healthy aging, aging effects on, 128 317-318 behavioral data, 128-129 substrates of brain-imaging data, 129-130 genes and functional pathways in molecular strategy selection, 128 plasticity, 68-71 network dynamics and cognitive structure, aging effects on, 131 behavioral data, 131-132 73-74 brain-imaging data, 132 synapses, systems, and circuits in molecular strategy sequential difficulty, 133-134 plasticity, 71-73 strategy switch costs, 136 technology support for, 717-718, 739-740 design and implementation considerations strength and vulnerability integration (SAVI), in, 729-731 303-304 arousal modulation in, 110-111, 305 illustrative examples of, 722-726, 727 empirical support for, 304 potential of, 721-722 attentional deployment, 306-307 research limitations and opportunities in, cognitive change, 307-308 726-729 process model of emotion regulation overtheories and frameworks guiding, 719-721 ubiquitous nature of technology in, view 304 response modulation, 308-309 718-719 theoretical models of, 717-718 situation selection and modification, 305 stress well-being role in, 532-533, 545, 589 aging effects on physiological response to, individual resources and constraints in, 110-111 540-542 prenatal, 432-433 neurobiological pathways linking, 539-540 animal models of, 425-427 pathways linking, 536-539 human studies of, 427-430 sociohistorical context resources and conmechanisms underlying dementia risk due straints in, 542-545 to, 430-432 well-being as antecedent for cognitive stressor reactivity, 537 function and development, 535-536 STS. See superior temporal sulcus well-being as outcome of cognitive function substantia nigra, 84 and development, 533-535 successful aging, 1-2, 62, 63-64, 74-75, 76, 123 sunk costs, decisions about, 223 animal models of, 67-68 super-agers, 63. See also successful aging blood biomarkers of, 571-572, 573 blood biomarkers in, 572 cognitive reserve and, 37, 40 superior temporal sulcus (STS), 373 conceptualization of, 64-67, 499-501, sustained attention tasks, 162-163 717-718 SWS. See slow wave sleep control beliefs in, 514, 520-524, 589 synapses, in neuroadaptive aging, 71-73 aging effects on, 516 synaptic tagging hypotheses, 241-242 construct of, 514-516 syntactic processing, 491-492 systems, in neuroadaptive aging, 71-73 developmental and contextual approaches to, 518-520 systolic blood pressure (SBP), 340-342 individual differences in, 516-517, 519-520 intraindividual variability in, 518, 519-520 taste, 190-191 grit role in, 499-500, 508, 589 tau pathology association between, 504-508 blood biomarkers for, 574-575 concept of grit, 499-500, 501-504 in locus coeruleus, 94-95, 104 concept of success, 499-501 tDCS. See transcranial direct current stimulation nutrition role in, 612-613 older adult use of, 719, 720, 731 perspectives on growing older and, 62 social relationships in, 315 successful aging support with, 717-719, aging-related decline in social network size, 739-740 design and implementation considerations mechanisms of associations between, in, 729-731 353-356 emerging technologies, 719 physical and mental health implications of illustrative examples of, 722-726, 727 social network size, 316-317, 351 potential of, 721-722



Index

research limitations and opportunities in,	transmission deficit theory, 483–485
726–729	bilingualism consequences for, 486
theories and frameworks guiding, 719-721	travel, technology support for, 724
ubiquitous nature of, 718–719	trisynaptic circuit, 71–73
TechSAge model, 720	tuberomammillary nucleus, in Alzheimer's
telecare, 726	disease, 109–110
temporal processing, 181-182	tyrosine hydroxylase, 107
tenacious goal pursuit (TGP), 501, 503-504,	
505	UFOV. See useful field of view
time acceleration, 265	underarousal, 101, 104-106
time perception, 254, 265, 266-267, 277	undernutrition, prenatal
age-related declines in duration judgments,	animal models of, 425-427
257	human studies of, 427–430
divided attention deficits, 259-260	unified theory of acceptance and use of
internal clock slowing, 258-259	technology 2 (UTAUT2), 720
methodological considerations, 257–258	updating hypothesis, 668–670, 675, 676–678
time acceleration effects in, 265	updating training, 669–670
age-related increases in lifetime appreciation,	useful field of view (UFOV), 188–189, 190
261	UTAUT2. See unified theory of acceptance and
socioemotional selectivity theory, 261–264	use of technology 2
aging, time acceleration, and goals, 265	use of teemiology 2
aging and attention to time, 266	valence, memory effects of, 236–240
bottom-up and top-down processing in,	values clarification, 224
255–257	vascular depression, 593, 603–604, 739
linkages between, 265–266	clinical features of
consequences of perceived time, 254–255	clinical phenotype, 594
personal past influence on, 384–385	executive dysfunction, 595–596
timing tasks, 164	pathways to, 594–595
tip-of-the-tongue (TOT), 483–485, 486	neurobiology of
TMS. See repetitive transcranial magnetic	altered structural and functional connectiv-
stimulation	ity, 596–597
TOMM40 gene. See translocase of outer mito-	novel neuroimaging approaches to, 597–59
chondrial membrane 40 gene top-down processing	white matter hyperintensities, 596–597 treatment of
attention, 162–165, 273–274	computerized cognitive remediation, 601
cost of compensation with, 165–169	exercise and lifestyle interventions, 603
motivation and emotion influences on,	noninvasive brain stimulation, 601–602
169–171	pharmacologic and nonpharmacologic
time, 255–257	
bottom-up linkages with, 265–266	approaches to, 599–600
TOT. See tip-of-the-tongue	psychotherapy, 600–601
	vegetable consumption, 617–618
training. See cognitive training	ventral attention network, 107
training studies, activity participation interven-	ventromedial prefrontal cortex (vmPFC)
tions, 451–452	in emotion recognition, 373
transactive memory, 286–288	in memory retrieval, 246
transcranial direct current stimulation (tDCS),	verbosity, 368–369
21–22	vestibular system, 191
transfer, of cognitive training, 666–668, 676–678,	visual acuity, 187
737–738	visual perception
distraction suppression hypothesis of,	age-related deficits in, 187
670–675, 676–678	attention effects of, 163–164
durability of, 675–676	driving consequences of, 190
mechanism considerations in, 668	reading consequences of, 189–190
updating hypothesis of, 668–670, 675,	scotopic function and dark adaptation, 188
676–678	spatial contrast sensitivity, 187–188
translocase of outer mitochondrial membrane 40	visual acuity, 187
(TOMM40) gene, 561	visual processing speed, 188-189



764 Index

visual perception (cont.) well-being as antecedent for cognitive function and development, 535-536 bilingualism and, 482 in sensory deficit hypothesis, 5-6 well-being as outcome of cognitive function Westerner and East Asian differences in, and development, 533-535 emotional, 299-300 460-461 visual perception training, 673-674 social relationships in, 315-323, 324 visual processing speed, 188-189 PERMA model of, 720 vitamin B6, 613-614 Western diet, 619 Westerners, cognitive differences between East vitamin B12, 613-614 vitamin D, 616 Asians and, 459-460 vitamin K, 615-616 aging effects on, 466-467 vitamin K antagonists (VKA), 615-616 in object- and context-focused perception and vmPFC. See ventromedial prefrontal attention, 460-461 cortex in semantic and mathematical processing, 461-462 wakefulness, 102 in social mores, affective reactions, and selfweight loss, 620 concept, 462-463 well-being white matter, cognitive training effects on, 54 cognitive function and, 532-533, 545, white matter hyperintensities (WMH) cognitive reserve and, 39 589 age, gender, and education role in, in vascular and late-life depression, 596-597 540-541 word retrieval, 483-485, 486 health behavior role in, 537-538 work environment, 354-355 individual resources and constraints in, working memory, 7 heritability of, 552-554 540-542 marital status role in, 543-544 in higher-level language processing, 491-492 neurobiological pathways linking, inhibitory deficits in, 7-8 539-540 neurotransmitter role in, 82-83, 87, 93-95, 123 pathways linking, 536-539 acetylcholine, 83, 85-86, 92-93 perceived control role in, 542 dopamine, 83, 84, 85, 87-90 physical health role in, 541-542 noradrenaline, 83, 84, 85, 90-92 secular trends role in, 544-545 physical activity impact on, 647-651, 657 social participation role in, 538-539 stereotype threat impact on, 404-406, 407 sociohistorical context resources and updating in, 668-670 constraints in, 542-545 updating training of, 669-670, 676-677 working self, 388 stressor reactivity role in, 537