

academic function 78–80	development of diagnostic concept 5–7
acquired aphasia with epilepsy (Landau-Klefner	differential diagnosis 5–6, 19
syndrome) 16–18	nonverbal learning disability profile 5-6, 19
adrenergic function and stress 199–200	overlap with other diagnostic groups 5-6
adult life outcomes	pragmatic problems 95
accounts of adults with autism 269-73	pressures on individuals 293-5
affective disorders 291	prevalence estimations 45–6, 47
anxiety 291	psychiatric disturbance risk in adulthood 293–5
Asperger syndrome follow-up studies 277–81	social interaction difficulties 88, 89–90
autobiographical writings 272–3	attachment behavior 87-8
bipolar disorder 291	attachment disorder, differential diagnosis 19
causes of death 295–6	attention deficit disorder plus PDD 6-7
comparison between autism and Asperger	attentional abnormalities 74–5
syndrome 287–8	atypical antipsychotic agents 223-7
criminality and autism 296–9	auditory integration training 262–3
delusional thoughts 292	augmentative and alternative communication
depression 291	strategies 139, 143, 144, 258
effects of early interventions 299–300	autism
employment 280, 282, 283–4	definitions subsequent to Kanner 8–9
epilepsy 295	development of diagnostic concepts 1-8
factors affecting outcomes 284–7	diagnosis and definition 8–15
first descriptive studies 270–2	differential diagnosis 15–19
follow-up reports (early) 273–4	Aberrant Behavior Checklist (ABC) 14
follow-up studies (later) 274–7	Autism Diagnostic Interview-Revised (ADI-R) 12,
Hans Asperger's accounts 272	14–15
high-functioning autism follow-up studies 277–81	Autism Diagnostic Observation Schedule (ADOS)
independent living 280, 282, 284	12, 14–15
interpersonal relationships 280, 282, 284	autistic savants 80–2
isolated psychotic symptoms 292	autobiographical writings on autism 272-3
mortality rates 295–6	
possibility of improvement over time 289–90	behavioral assessment 256-7
psychiatric case studies 292–3	developmental appropriateness of treatment
psychiatric disturbance risk 293–5	256–7
psychiatric disturbances in adulthood 290–5	generalization of new skills 256
risk of deterioration in adulthood 288–90	maintenance of new skills 256
schizophrenia 290–91	treatment priorities 256
suicide rates 295–6	behavioral interventions 255
summary of results of outcome studies 280, 281-4	auditory integration training 262-3
Tourette syndrome 295	augmentative communication methods 258
affective disorders, in adults with autism 291	controversial treatments 261–3
alternative forms of communication 139, 143, 144,	decreasing maladaptive behavior 259-60
258	developmental appropriateness of treatment
amantadine 237–8	256–7
anxiety disorder, in adults with autism 291	early intervention 260–1
Asperger, Hans, accounts of adult life outcomes 272	facilitated communication 261-2
Asperger syndrome	generalization of new skills 256
adult follow-up studies 277–81	language teaching 257–8
and high-functioning autism 5-6, 19	maintenance of new skills 256
communication 140-3	peer modeling 259



behavioral interventions (cont.)	communication interventions 146
role of the family 263	communicative acquisition in ASD
social skills teaching 258-9	alternative forms of communication 139, 143, 144
teaching new skills 257–8	Asperger syndrome 140–3
treatment priorities 256	augmentative and alternative communication
beta-adrenergic blockers 235	strategies 139, 143, 144
bipolar disorder, in adults with autism 291	echolalia 137
birth complications 182–5	first year of life 132–3
brain, evolved adaptations 313–24	high-functioning autism 140–3
brain catecholamine dysfunction 199	hyperlexia 141
brain imaging studies 189–95	intonation abnormalities 137–8
cerebellum (MRI) 189–90 fMRI, PET and SPECT studies 192–5	language use in preschool children 138–9, 140
	later language development 139–43
functional abnormalities 192–5	nonspeaking children 139, 140
MRI studies 189–91	nonspeaking older people 143, 144
structural abnormalities 189–91	overly literal language interpretation 142
see also neurobiology of autism	parents' concerns around the second year 134
brainstem auditory-evoked responses 200	pedantic language style 141–3
buspirone 233	preschool development 135–9
	pronoun reversal 136–7
Cambridge Neuropsychological Test Automated	prosodic disorders 137–8
Battery (CANTAB) 104	toddler years 133–5
candidate genes and association studies 168-9	use of Sign language or pictures 139, 143, 144
carnosine 239	comorbidities in ASD 165, 180 see also medical
central coherence theory 106-9	conditions associated with autism
cerebellar abnormalities in autism 188–90	congenital rubella, association with autism 42-3
cerebral palsy, association with autism 42-3	criminality and autism 296–9
Childhood Autism Rating Scale (CARS) 14	causes of offending 299
childhood disintegrative disorder (Heller's	estimates of offending rates 298–9
syndrome) 4–5, 221	reports of 296–8
development of diagnostic concept 4–5	
differential diagnosis 16–18	D-cycloserine 238
early loss of language 16–18	definition of autism 8–15
prevalence estimations 45, 47, 48	dementia infantilis 4–5
childhood schizophrenia, differential diagnosis	_
18–19	dementia praecov 1, 2
	dementia praecox 1–2
chromosomal abnormalities associated with autism	depression, in adults with autism 291
202–5	dermatoglyphic patterns 181–2
citalopram 232–3	detection of dispositional intent 322
clomipramine 228–9	deviant behaviors 90–1
clonidine 236	dextroamphetamine 222–3
clozapine 227	diagnosis of autism 8–15
cluster reports 60–1	Asperger syndrome and high-functioning autism
cognitive flexibility 102-3, 104, 105-6	5–6, 19
communication	Aberrant Behavior Checklist (ABC) 14
alternative forms 139, 143, 144	Autism Diagnostic Interview-Revised (ADI-R) 12,
domains 129, 130	14–15
language 129, 130	Autism Diagnostic Observation Schedule (ADOS)
language content 130-1	12, 14–15
language domains 129-31	categorical definition of autism 9-12
language form 130, 131	Childhood Autism Rating Scale (CARS) 14
language use 131	definitions subsequent to Kanner 8–9
phonology and syntax 130, 131	development of precise definitions 8–9
pragmatics 131	diagnostic instruments 12–15
semantics 130–1	differential diagnosis 15–19
speech 129–31	dimensional approach 12–15
communication assessment 143–6, 147	DSM-III definition 9–10
communication impairment 94–8	DSM-III definition 19–10 DSM-III-R definition 10–11
1	DSM-III-R definition 10–11 DSM-IV definition 11–12
nonspeaking children 139, 140	
nonspeaking older people 143, 144	early loss of language 16–18



ICD-10 definition 11	social skills teaching 258-9
inclusion of subskill impairment descriptions	teaching new skills 257–8
324–9	treatment priorities 256
presence of mental retardation 18	EEG abnormalities in autism 185–7
presence of schizophrenia 18–19	emotion perception 91–3
regression in early development 16-18	emotional intelligence 323
Rimland's diagnostic checklist 14	emotions, ability to experience and express 313,
Vineland Adaptive Behavior Scales 15	316–18
diagnostic concepts, historical development 1–8	empathy, ability to experience 313, 316–18
Asperger syndrome 5–7	employment in adult life 280, 282, 283–4
autistic disorders 1–4	epidemiological surveys of autism 33–4
broader phenotype of autism 6–7	Asperger syndrome prevalence estimations 45–6
childhood disintegrative disorder (Heller's	47
syndrome) 4–5	associated medical conditions 42–3
continuity of ranges of disorders 3, 5–8	autistic disorder prevalence estimations 35–7,
definitions subsequent to Kanner 8–9	41–2
high-functioning autism 5–6	cerebral palsy association 42–3
ideas about autism and schizophrenia 3	characteristics of autistic samples 35–7, 40–1
ideas about parent-child interactions 4	childhood disintegrative disorder prevalence
ideas about parental achievement 4	estimations 45, 47, 48
ideas about psychoses in children 1–2	cluster reports 60–1
Kanner's description of autism 2–4 medical conditions associated with autism 3	comparison of cross-sectional surveys 53–4 congenital rubella association 42–3
'nonautistic' pervasive developmental disorders	design of surveys 34
4–7	Down's syndrome association 42–3
occurrence of mental retardation 3–4	epilepsy association 43
PDD-NOS 7–8	fragile X association 42–3
Rett disorder 7	immigrant status association studies 35–7, 58–60
diagnostic instruments 12–15	incidence studies 56
diagnostic phenotype for autism 324–9	measures of disease occurrence 34
dimethylglycine 239–40	neurofibromatosis association 42–3
disintegrative psychosis see childhood disintegrative	PDD-NOS prevalence estimations 43–4, 45
disorder	PKU association 42–3
divalproex sodium 238-9	prevalence for combined PDDs 47-50
donepezil 240	race association studies 35–7, 58–60
dopamine	referral rate trends 51-3
drugs affecting function 221–3	repeat surveys in the same area 35-7, 54-5
involvement in autism 195, 199	selection of studies 34-7, 38
Down's syndrome association with autism 42-3	social class association studies 35-7, 60
DSM-III definition of autism 9-10	study design impact on prevalence 53-4
DSM-III-R definition of autism 10-11	successive birth cohort studies 35-7, 55-6
DSM-IV criteria for autistic disorder 11-12, 24-5	survey descriptions 38-40
	time trends in incidence rates 35–7, 50–7
early interventions 260–1	tuberous sclerosis association 42-3
effects on adult life outcomes 299-300	epilepsy
echolalia 83–4, 95, 137	association with autism 43, 185–7
educational interventions 255	in adults with autism 295
auditory integration training 262–3	epinephrine 195, 199–200
augmentative communication methods 258	epistatic genetic effects 166–8
controversial treatments 261–3	epistemic egocentrism and theory of mind 321–2
decreasing maladaptive behavior 259–60	etiology of autism, and associated medical
developmental appropriateness of treatment	conditions 202–5
256–7	event-related potentials 200–2
early intervention 260–1	evolved brain adaptations 313–24
facilitated communication 261–2	executive function theory 102–6
generalization of new skills 256	for a managerian 01 2
language teaching 257–8 maintenance of new skills 256	face perception 91–3 face recognition and expression interpretation 313,
peer modeling 259	318–19
role of the family 263	facilitated communication 261–2
Total of the fairing 200	inciniated Communication 201-2



family	ICD-10 criteria for autism 11, 24
role in treatment process 263	'idiot savant' abilities 80–2
use of behavioral teaching strategies 263	immigrant status association studies 35–7, 58–60
fenfluramine 228	independent living in adult life 280, 282, 284
fluoxetine 231	inhibition 104
fluvoxamine 229–30	inositol 234
fragile X syndrome, association with autism 42-3,	intellectual function (IQ) 75-8
204	interpersonal relationships in adult life 280, 282, 284
gait abnormalities 180-2	interventions
generative complexity 310-11	early interventions 260-1, 299-300
genes for autism susceptibility	for communication 146
candidate genes and association studies 168–9	sign language 97–8
genome-wide linkage scans 169-70, 172	social skills teaching 258–9
identification 168-70, 172	speech training 97–8
intrauterine effects 172	to reduce maladaptive behavior 259-60
maternal genetic factors 172	see also behavioral interventions; educational
modifier genes 172	interventions
genetic abnormalities associated with autism 202-5	intonation abnormalities 137-8
genetic epidemiology of ASD	intrauterine effects, and autism susceptibility 172
comorbidities 165	
effects of stoppage rules 159-60	'joint attention' deficits 88–9
etiological heterogeneity 165	
evidence for genetic basis 157–60	Kanner, description of autism 2–4
genetic heterogeneity 165-6	
heritability estimates 157–60	lamotrigine 237
lesser variant of ASD 161–3	Landau–Klefner syndrome (acquired aphasia with
pleiotropy 163–4	epilepsy) 16–18
variable expressivity of genes 161–3	language 129, 130
genetic inheritance models 166–8	early loss of 16–18
epistatic effects 166–8	idiosyncrasies and neologisms 96–7
lesser variant inheritance 168	language content 130-1
multilocus models 166–8	language domains 129–31
oligogenic multilocus models 166–8	language form (phonology and syntax) 130, 131
polygenic multilocus models 166–8	language impairment 94–8
genome-wide linkage scans 169–70, 172	language interpretation, overly literal 142
Gerland, Gunilla 273	language style, pedantic 141–3
glutamate function, drugs affecting 237–8	language teaching 257–8
Grandin, Temple 272	language use 131
guanfacine 236	in preschool children 138–9, 140
1-1: 1-1 222	late-onset autism see childhood disintegrative
haloperidol 222	disorder (CDD)
hand dominance patterns 181	Lawson, Wendy 272–3
Heller's syndrome <i>see</i> childhood disintegrative disorder	lesser variant of ASD 161–3
	inheritance pattern 168 levetiracetam 240–1
high-functioning autism adult follow-up studies 277–81	linguistic idiosyncrasies and neologisms 96–7
and Asperger syndrome 5–6, 19	lithium 239
communication 140–3	lofexidine 236–7
diagnostic concept 5–6	Total and Est
pragmatic problems 95	maladaptive behavior, interventions to reduce
pressures on individuals 293–5	259–60
psychiatric disturbance risk in adulthood 293–5	maternal genetic factors, and autism susceptibility
social interaction difficulties 89–90	172
Holliday Willey, Lianne 273	medical conditions associated with autism 42–3,
hormones which regulate social attachment 313–15	202–5 see also comorbidities in ASD
human social behaviors see social behaviors	memory disorder 83–6
human social skills see social skills	cued recall 84–5
hyperlexia 78-9, 80-1, 141	free recall 84–5
hyperserotonemia 195–8	primacy effects 84



recency effects 84	norepinephrine 195, 196–7, 199–200
recognition memory 84	drugs affecting function 235-7
role of organization and meaning 85	
rote memory 83–4	olanzapine 225–6
short-term memory 83–4	oligogenic multilocus genetic models 166-8
working memory 85–6	ontogenetic construction 312
methylphenidate 222–3	ontogenetic inflection 312
mirror neurons and imitative motor learning 313,	opioid peptides 199
315–16	outcomes see adult life outcomes
mirtazapine 233–4	oxytocin 242
modifier genes, and autism susceptibility 172	
mood stabilizing drugs 238–9	paroxetine 230–1
mortality rates in adults with autism 295–6	PDD (pervasive developmental disorder)
causes of death 295–6	prevalence (all types) 47–50
motor development 73–4	time trends in incidence rates 35–7, 50–7
multilocus genetic models 166–8	PDD-NOS (PDD-not otherwise specified)
muthocus genetic models 100–8	development of diagnostic concepts 7–8
maltmayama 241, 2	
naltrexone 241–2	differential diagnosis 19
neuroanatomy 187–9	prevalence estimations 43–4, 45
brain imaging studies 189–95	peer modeling 259
cerebellar abnormalities in autism 188–90	perceptual development 70–3
neurobiology of autism	pharmacology see psychopharmacology
brain imaging studies 189–95	phonology and syntax 130, 131
classification schemes and instruments 179-80	phylogenetic construction 311–12
comorbidity 180	phylogenetic inflection 312
data interpretation challenges 179–80	pictures, use to communicate 139, 143, 144
neuroanatomy 187–9	PKU (phenylketonuria), association with autism
neurochemistry 195–200	42–3
neurology and related conditions 180–7	pleiotropy 163–4
neurophysiology 200-5	polygenic multilocus genetic models 166–8
neurochemistry 195–200	postural abnormalities 180–2
adrenergic function and stress 199-200	pragmatic problems 95
brain catecholamine dysfunction 199	pragmatics 131
dopamine 195, 199	pre- and perinatal conditions 182-5
epinephrine 195, 199–200	pregnancy and birth complications 182-5
hyperserotonemia 195–8	prevalence estimations
maturation effects on monoaminergic systems	Asperger syndrome 45–6, 47
195	autistic disorder 35–7, 41–2
noradrenergic system 195	childhood disintegrative disorder 45, 47, 48
norepinephrine 195, 196–7, 199–200	PDD (all types) 47–50
opioid peptides 199	PDD-NOS 43–4, 45
purposes of autism research 195	pronoun reversal 136–7
serotonin 195–8	prosodic disorders 137–8
tryptophan 195, 197–8	psychiatric disturbances in adulthood 290–5
neurofibromatosis, association with autism 42–3	psychological factors in autism 69–70
neurological dysfunction 180–2	academic function 78–80
neurology and related conditions 180–7	attachment behavior 87–8
EEG abnormalities in autism 185–7	attentional abnormalities 74–5
epilepsy association with autism 185–7	autistic savants 80–2
neurological dysfunction 180–2	central coherence theory 106–9
pre- and perinatal conditions 182–5	cognitive flexibility 102–3, 104, 105–6
seizure disorders in autism 185–7	communication impairment 94–8
neurophysiology 200–5	deviant behaviors 90–1
brainstem auditory-evoked responses 200	echolalia 83–4, 95
event-related potentials 200–2	emotion perception 91–3
medical conditions associated with autism 202–5	executive function theory 102–6
'nonautistic' pervasive developmental disorders 4–7	face perception 91–3
nonspeaking children 139, 140	hyperlexia 78–9, 80–1
nonspeaking older people 143, 144	'idiot savant' abilities 80–2
noradrenergic system 195	influence of level of functioning 69-70



psychological factors in autism (cont.) inhibition 104	quetiapine 226
intellectual function (IQ) 75-8	race association studies 35-7, 58-60
'joint attention' deficits 88–9	rapid cue reversal learning 322
language impairment 94–8	Rhett disorder 221
memory disorder 83–6	association with autism 204
motor development 73–4	development of diagnostic concepts 7
perceptual development 70–3	
	differential diagnosis 16–18
pragmatic problems 95	early regression 16–18
sensorimotor development 70–3	right hemisphere learning problems 6–7
social development and behavior 86–91	Rimland's diagnostic checklist 14
social impairments 86–91	risperidone 223–5
socially embarrassing behavior 90–1	0:1 01 070
splinter skills 80–2	Sainsbury, Clare 273
theory of mind hypothesis 98–101	schizoid disorder 6–7
psychopharmacology of PDDs	schizophrenia, in adults with autism 290–1
amantadine 237–8	schizophrenia (childhood), differential diagnosis
atypical antipsychotic agents 223–7	18–19
beta-adrenergic blockers 235	secretin 242–3
buspirone 233	seizure disorders in autism 185–7 see also epilepsy
carnosine 239	selective mutism, differential diagnosis 19
citalopram 232–3	semantic-pragmatic disorder 6-7, 97
clomipramine 228–9	semantics 130–1
clonidine 236	sensorimotor development 70-3
clozapine 227	sensory deficits see neurological dysfunction
D-cycloserine 238	serotonin
dextroamphetamine 222–3	drugs affecting function 227-35
dimethylglycine 239–40	hyperserotonemia 195–8
divalproex sodium 238–9	involvement in autism 195–8
donepezil 240	serotonin synthesis, developmental changes 198
drugs affecting dopamine function 221–3	sertraline 231–2
drugs affecting glutamate function 237–8	Sign language 139, 143, 144
drugs affecting norepinephrine function 235–7	sign language interventions 97–8
drugs affecting serotonin function 227–35	social behaviors
fenfluramine 228	evolutionary mechanisms 310–13
fluoxetine 231	generative complexity 310–13
fluvoxamine 229–30	innate factors 309–13
guanfacine 236	ontogenetic construction 312
haloperidol 222	_
* .	ontogenetic inflection 312
inositol 234	phylogenetic construction 311–12
lamotrigine 237	phylogenetic inflection 312
levetiracetam 240–1	primate prosocial behaviors 309–10
lithium 239	spandrelism 311
lofexidine 236–7	social class association studies 35–7, 60
methylphenidate 222–3	social cognition, brain systems to support 313, 320-3
mirtazapine 233–4	social development and behavior 86–91
mood stabilizers 238–9	social evaluation 322–3
naltrexone 241–2	social gaze recognition 313, 319–20
olanzapine 225–6	social impairments 86–91
oxytocin 242	social neuroscience
paroxetine 230–1	models of brain bases of social skills 307–8
psychostimulants 222–3	social diagnostic criteria for autism 308–9
quetiapine 226	see also diagnostic phenotype of autism; social
risperidone 223–5	behaviors; social skills
secretin 242–3	social skills
sertraline 231–2	brain systems to support complex social
tianeptine 234	cognition 313, 320–3
venlafaxine 234–5	detection of dispositional intent 322
ziprasidone 226–7	emotional intelligence 323
psychostimulants 222–3	empathy 313, 316–18



343 Index

epistemic egocentrism and theory of mind 321-2 evolved brain adaptations 313-24 experience and expression of emotions 313, 316-18 face recognition and expression interpretation 313, 318-19 hormones which regulate social attachment mirror neurons and imitative motor learning 313, 315-16 rapid cue reversal learning 322 social evaluation 322-3 social gaze recognition 313, 319-20 syntactic language processing in the brain 313, 323-4 social skills teaching 258-9 socially embarrassing behavior 90-1 spandrelism 311 speech 129-31 training interventions 97-8 splinter skills 80-2 stoppage rules 159-60

suicide rates in adults with autism 295-6 syndromes associated with autism 202-5 syntactic language processing in the brain 313, 323-4 syntax and phonology 130, 131 theory of mind hypothesis 98-101 and epistemic egocentrism 321-2 tianeptine 234 Tourette syndrome 295 Tower of Hanoi test 102-3 tryptophan, involvement in autism 195, 197-8 tuberous sclerosis, association with autism 42-3, 204 variable expressivity of genes 161-3 venlafaxine 234-5 Vineland Adaptive Behavior Scales 15 walking, age of starting 181 Williams, Donna 272 Wisconsin Card Sorting Test (WCST) 102-3, 105-6

ziprasidone 226-7