Index

Page references to Figures or Tables will be followed by the letters “f” or “t” in italics as appropriate.

adjacency pair, conversation analysis, 153
agents, virtual, 178, 183–187
alanine, 333
algorithms
  computational modeling, 211–212, 212
corpus linguistics, 241
libraries of, 232
neuroimaging, structural, 290
alleles, 333, 334, 335, 351
AlphaGo (Google), 214
Alzheimer’s disease, 312, 324
Amazon Mechanical Turk (MTurk), 195–196, 197, 199
Amendments to the Education for All Handicapped Children Act 1986, US, 50
American Psychological Association, 202
amino acids, 331, 333, 351
analysis of variance (ANOVA), 72, 136, 254, 255, 282
automated, 78
F1/F2-ANOVAs, 78
mixed, 8, 9, 11
random factors, 78
repeated-measures, 25, 27, 29, 33
Anatomo-Clinical Overlapping Maps (AnaCOM), 291
animal studies, habituation techniques, 2
ANOVA (analysis of variance) see analysis of variance (ANOVA), 8, 9, 11
aphasia quotient (AQ), 301
apparatus
  conversation analysis (CA), 154–155
electrophysiological methods, 250–252
  functional magnetic resonance imaging (fMRI), 267–268f
  functional near infrared spectroscopy (fNIRS), 278–279
habituation techniques, 3–4
Intermodal Preferential Looking Paradigm (IPLP), 21–22
language sampling, 46–47
parent report, vocabulary assessment by, 52–53
structural neuroimaging, 292, 293f, 294
virtual reality (VR), 176–179
visual world paradigm (VWP), 92–93
word priming and interference paradigms, 115–116
artificial neural networks, 209
assessment-implicative interrogative, 156, 167
Audacity® software, 116
audio-recording technology, 45, 46, 47, 184
  WAV audio files, 181
autism spectrum disorders, 44, 57
avatars, 179–180, 187
Avon Longitudinal Study of Parents and Children (ALSPAC), UK, 343
backpropagation algorithm, 212
Bayesian models, 209, 211, 214, 225–226
behavioral data analysis, lesion studies, 314–315
bilingualism, 5, 10, 11, 14
Bingo-game paradigm, 141
blocking paradigms, 120, 124
blood level oxygenation dependent signal (BOLD)
  functional magnetic resonance imaging (fMRI), 267, 268, 270–272, 275, 277
  functional near infrared spectroscopy (fNIRS), 279
  measured via light absorption, 279, 280f
blood light absorption properties, 278
BOLD see blood level oxygenation dependent signal (BOLD)
Bonferroni methods, 318
boundary (Rayner) paradigm, eye-movement tracking, 68, 73–74, 85
brain, 210, 211, 276f
  see also lesion studies; neuroimaging, structural
  Broca’s area, 292
  Brodmann Area, 275
  frontal aslant tract (FAT), 292
  gray and white matter, 290, 291, 292, 302f
  insula, 316
  medial prefrontal cortex, 292
  middle temporal gyrus (MTG), 319
  pre-supplementary motor cortex, 292
  right hemisphere lesions, 312
  “standard brain,” 274
  superior temporal gyrus (STG), 319
  Wernicke’s area, 292, 319
brain morphometry, 290, 303
  Broca’s area, 292
  Brodmann Area, 275, 325
CA see conversation analysis (CA)
calibration, 74, 85
CAVE (computer-activated virtual environments), 177
CDIs see communicative development inventories (CDIs)
cerebral blood flow (CBF), 294, 303
cerebrospinal fluid (CSF), 290, 292, 294, 303
Child Language Data Exchange System (CHILDES), 48, 49, 55, 218
childhood apraxia of speech (CAS), 341, 347
Children of the National Longitudinal Study of Youth, 60
chromosomes, 331, 333, 351
  chromosomal rearrangement, 344
clauses
  main clause (MC), 133, 136, 139
  prosodic characteristics, 20
  reduced relative clause (RR), 133, 136, 139
  small clause sentences, 143, 144f, 145T
CLAWS software package, 233
closed-class words, 41, 62
co-articulation, speech, 96
Codes for the Human Analysis of Transcripts (CHAT), 48
coding
  conversation analysis (CA), 167
  Interactive Intermodal Preferential Looking Paradigm (IIPLP), 26
  inter-coder reliability checks, 142
  looking-while-listening paradigm (LWL), 29
  structural priming, 142
  visual world paradigm (VWP), 99
cohorts
  cohort competitor, visual world paradigm, 92
  molecular genetic methods, 342–343
Communicative Development Inventories (CDIs), 54, 57, 59
  CDI: Words & Gestures (CDI:WG), 52, 53, 55, 56
  CDI: Words & Sentences (CDI:WS), 52, 55, 56
  Scoring Program, 55
competitors, visual world paradigm, 92, 107
  “hidden competitor” designs, 106
composition, conversation analysis, 160–161, 164, 170
compounds, 44
comprehension priming, 133, 146, 148
computational modeling, xvii, 83, 208–229
  apparatus/tools, 211–216
  assumptions/rationale, 208–211
  Bayesian models, 209, 211, 214, 225–226
  challenges and future directions, 223–225
  connectionism, 209, 210–211, 215, 220–223
  algorithms, 212–214
computational modeling (cont’d)
data analysis, 217–218
distributional semantic models, 210, 226
examples, 218–223
DevLex-II model, 220–223
Yu and Ballard model, 218–220
Hebbian learning, 214, 221, 226
Hyperspace Analogue to Language
(HAL), 210, 212, 215, 216, 224, 226, 236, 237
hypothesis testing, 210
latent semantic analysis (LSA), 210, 212, 216, 226, 236, 237
nature of stimulus, 216–217
parallel distributed processing (PDP), 209, 215, 225
practical considerations, 214–216
probabilistic approach, 209–210, 215, 218–220
algorithms, 211–212
representation and analysis, 216–218
self-organizing map (SOM), 213, 214, 215, 220, 226
simple recurrent network (SRN), 213, 214, 226
supervised learning, 226
unsupervised learning, 226
computer-activated virtual environments (CAVE), 177
computerized comprehension task (CCT), 59
computerized language analysis (CLAN), 49
computerized tomography (CT), 289, 293f, 303, 326
lesion studies, 313, 315
conditional relevance, conversation analysis, 153
Conditioned Head Turn procedure, 13, 34
connectionism, computational modeling, 209, 210–211, 215, 220–223, 225
algorithms, 212–214
corpus linguistics, 237
consonants, infants’ discrimination of, 3
Contextual Self-organizing Map Package, 215
conversation analysis (CA), xvii, 151–173
see also speech and spoken language action, 161, 170
adjacency pair, 153
advantages and disadvantages, 168
analysis of each case in the collection, 160–161
analysis of variation in the collection, 161–162
apparatus, 154–155
assessment-implicative interrogative, 156, 167
candidate phenomenon, identifying, 155–156
collection of cases, building, 157–159
composition, 160–161, 164, 170
concepts/description, 151–152
conditional relevance, 153
data, nature of, 154–155
data collection and analysis, 155–167
defining boundaries of the phenomenon, 163–164
deviant cases, analysing, 165, 170
ecological validity, 168
epistemics, 166
ethnomethodology, 170
first pair part (FPP), 153
formal account of the phenomena, producing, 166–167
historical/conceptual background, 152–154
interactional phenomenon, 152, 170
naturally occurring interaction, 170
next-turn proof procedure, 156, 170
normative evidence, looking for, 165
order, 152
overlapping talk, 152
position, 170
and psycholinguistics, 168–170
quantitative research methods, 167–168
recommendations, 159
recording, 154–155
scripted interactions, 154
second pair part (SPP), 153
sequence organization, 153
talk, as vehicle for action, 153
transcription, 155
transition-relevance place (TRP), 153
turn design, 153, 164
turn-constructional units (TCUs), 153
turn-initial particles, 161
turn-taking procedures, 153
cose-occurrence statistics, 210, 215, 216
cross-situational co-occurrence, 218
corpus analysis, 85
corpus linguistics, xvii, 230–246
apparatus and tools, 232–233
assumptions/rationale, 231–232
concepts/description, 230–231
corpora, 230, 242
data collection, 238
exemplary applications, 239–240
language registers, 234, 235, 238, 241, 242
limitations and opportunities for validation, 240–242
megastudies, 241–242
natural language processing (NLP), 209, 233, 242, 243
parsing, xvi, 230, 233, 243
raw data vs. derived data, 233–234
semantic vectors, 235–237
stimuli and data, 233–237
tagging, 233, 243
word frequency data, 234–235
Wordnet, 242, 243
Corpus of Contemporary American English, 233
cross-cultural field studies, 192–195
best practice, 192–193
disadvantages, problems and pitfalls, 193–194
exemplary studies, 194–195
rationale, 192
crossing-over, stretches of DNA, 331, 351
Cross-Linguistic Lexical Norms (CLEX), 55
cross-situational word learning models, 225
Crowdflower, 197
crowdsourcing, 196, 197, 203, 230
CT see computerized tomography (CT)
“Cut & Break” project, 194
data, nature of
electrophysiological methods, 252–253
language sampling, 47
naturalistic data, 154
parent report, vocabulary assessment by, 54–55
raw data vs. derived data, 233–234
structural neuroimaging, 292, 293, 294
virtual reality (VR), 181
word frequency data, 234–235
data analysis
see also data, nature of; data collection
computational modeling, 217–218
conversation analysis (CA), 155–167
electrophysiological methods, 253–255
eye-movement tracking, during reading, 77–78
functional magnetic resonance imaging (fMRI), 273–276
functional near infrared spectroscopy (fNIRS), 282
habitation techniques, 8–9
Headturn Preference Procedure (HPP), 32, 33
Interactive Intermodal Preferential Looking Paradigm (IIPLP), 25–26
Intermodal Preferential Looking Paradigm (IPLP), 22–23
lesion studies, 314–318
Looking-While-Listening Paradigm (LWL), 29
molecular genetic methods, 343–346
Preferential Looking Paradigm Without Language (PLP), 30–31
virtual reality (VR), 181
visual world paradigm (VWP), 101–103
word priming and interference paradigms, 121–123
data collection
conversation analysis (CA), 155–167
corpus linguistics, 238
electrophysiological methods, 253–255
eye-movement tracking, 74
functional magnetic resonance imaging (fMRI), 272–273
functional near infrared spectroscopy (fNIRS), 281–282
habitation techniques, 8–9
language sampling, 47–49
lesion studies, 314–318
parent report, vocabulary assessment by, 53–54
virtual reality (VR), 181
visual world paradigm (VWP), 99–101
data reduction, eye-movement tracking, 75–79
durations, 76–78
inferential statistics, 78–79
locations, 76
databases
Child Language Data Exchange system (CHILDES), 218
genotyping, 339
SUBTLEX-US, 234
Deep Learning neural networks, 214
deformation-based morphometry (DBM), 290–291
deletions, DNA, 333
dementia, 312, 324
dense databases (DDBs), 48
developmental verbal dyspraxia, 341, 347
Developmental Vocabulary Assessment for Parents (DVAP), 51
deviant cases, conversation analysis, 165, 170
DevLex-II model, computational modeling, 220–223, 225
model architecture, 220–221
model simulation and data analysis, 222–223
stimulus representation, 221–222
dictionary entry words, 43, 44
diffusion orientation distribution function (dODF), 297
diffusion tensor imaging (DTI), 295–296, 312, 326
diffusion-weighted imaging (DWI), 289, 291–292, 303
Digital Imaging and Communications in Medicine (DICOM), 295
direct assessment, vocabulary assessment by, 58–61
apparatus/instruments, 59
assumptions/rationale, 58–59
data collection, 59–60
exemplary study, 60
disconnection syndromes, 311
dishabituation, 2, 3, 7
distractors, visual world paradigm, 98, 107
Distributional Semantic Models, 210, 226
DNA arrays, 343
DNA sequencing, 337
DNA variation, 330, 331, 332f, 333–334, 344, 346
techniques for characterizing, 336–341
domain-specific/domain-nonspecific methods, xvii, xviii
dominant monogenic inheritance, 345
double dissociations, 313
Double Object (DO), 133, 136, 137, 143, 145
Down Syndrome, 57
DTI see diffusion tensor imaging (DTI)
Dual-Purkinje image tracking, infrared, 70, 90
duplications, DNA, 333
DYX1CI gene, 341
echo time (TE), 292, 304
ecological validity, 168, 203
edge artefacts, 274
Edinburgh MAP task, 105
EEG see electroencephalogram (EEG)
ELAN software, 181
electrodes, 250–251
electroencephalogram (EEG), 72
see also electrophysiological methods;
event-related potentials (ERP)
differential amplification, 251
electrophysiological methods, 247, 248, 250–254, 258, 262
hemodynamic methods, 278, 281, 282, 284
noise, 251–252
non-laboratory settings, 193, 202
origins, 248
signal, 248, 259
simulated, 259, 260f
strength, 252
electrophysiological methods, xvii, 247–265
advantages and disadvantages, 258–262
apparatus, 250–252
assumptions/rationale, 248–250
blinks, measurement of, 251, 254
data collection and analysis, 253–255
electrodes, 250–251
electroencephalogram (EEG), 247, 248, 250–254, 258, 262
exemplary study, 256–258
experimental design, 247, 255, 256, 258
magnetoencephalography (MEG), xvii, 262
Mismatch Negativity (MMN), 250, 252
multiple comparisons correction procedure, 255
permutation procedures, 255
stimuli and data, 252–253
Emergentist Coalition Model (ECM), word learning, 26
“emic” perspective, 195
emotions, and language processing, 180, 185
epistemics, 166
E-prime software, 115
ERPs see event-related potentials (ERP)
ethnomethodology, conversation analysis (CA), 170
“etic” grid, 195
EUDICO Linguistic Annotator, 48
Eurocentric linguistic traditions, 192
event-related fields (ERFs), 261
event-related potentials (ERP)
see also electroencephalogram (EEG);
electrophysiological methods
creation of, 248, 254
ERP components, 248–249, 262
ERP effect, 250, 262
eye-motion tracking, during reading, 84
filtering, 253
habitation techniques, 3, 12
N400 amplitude, 249, 250, 251, 252, 254, 256, 257, 258
P200 amplitude, 249
P600 amplitude, 249, 250, 251, 252, 254, 258
signal, 248
structural priming, 132, 135, 138, 139
exemplary studies
corpus linguistics, 239–240
cross-cultural field studies, 194–195
direct assessment, vocabulary assessment by, 60
electrophysiological methods, 256–258
functional near infrared spectroscopy (fNIRS), 283
habitation techniques, 10–12
Headturn Preference Procedure (HPP), 33–34
Interactive Intermodal Preferential Looking Paradigm (IIPLP), 26–28
Intermodal Preferential Looking Paradigm (IPLP), 23, 24, 25
language sampling, vocabulary assessment by, 49
lesion studies, 318–323
Looking-While-Listening Paradigm (LWL), 29–30
molecular genetic methods, 346–349
parent report, vocabulary assessment by, 55–56
Preferential Looking Paradigm Without Language (PLP), 31–32
real world settings, conducting studies in, 202–203
structural neuroimaging, 300–301, 302f
virtual reality (VR), 182–184
expectation-maximization (EM) algorithm, 219
experience-based models, 232
experimental design
electrophysiological methods, 247, 255, 256, 258
eye-motion tracking, during reading, 72, 83
hemodynamic methods, 270
experimental paradigms
eye-motion tracking, during reading boundary (Rayner) paradigm, 68, 73–74, 85
moving window (McConkie) paradigm, 68, 72–73, 85
naming/lexical decision task, 83
visual world paradigm (VWP), 92
experimental software packages, 115–116, 197
experimenter-developed assessment, 61–62
Expressive Vocabulary Text (EVT), 57
external validity, 190, 204
eye movements
behavior and phenomenal experience, 69
crowding, 69
fixations see fixations, eye movements in natural tasks, 96–97
saccades (jerky movements) see saccade detection
time-locking, 95–96
tracking during reading see eye-motion tracking, during reading
visual world paradigm (VWP) see visual world paradigm (VWP)
eye-motion tracking, during reading, xvii, 68–88
see also eye movements; eye movements in natural tasks
advantages/disadvantages compared with related methods, 83–84
apparatus, 70–71
assumptions/rationale, 68–70
calibration, 74, 85
closed-loop control, 72
data analysis, 77–78
data collection, 74
data reduction, 75–79
durations, 76–78
inferential statistics, 78–79
locations, 76
dissociations between behavior and phenomenal experience, 69
experimental paradigms
boundary (Rayner) paradigm, 68, 73–74, 85
moving window (McConkie) paradigm, 68, 72–73, 85
naming/lexical decision task, 83
eye-movement tracking, during reading
(cont’d)

- eye-voice span (EVS)
  - co-registration of eye and voice, 79
  - exemplary LMM interaction based on two numeric covariates, 80–82
  - word boundaries, 79–80

- fixations see fixations, eye movements

- naming/lexical decision task, 83–84

- natural reading, 69, 70, 84

- oculomotor programming, 69, 72, 84

- perceptual span, 68, 69, 72, 73, 83, 85

- practical issues, 82–84

- problems/pitfalls, 82–83

- pupil-corneal reflection vector, 74

- rapid serial visual presentation (RSVP), 84

- saccades (jerky movements) see saccade detection

- self-paced reading, 84, 85

- tower-mounted trackers, 71

- tracking range, 72

- typical set up, 71f

- validation, 74

- video-based, 85

- word boundaries, 73, 79–80

- eye-voice span (EVS), 79–82

- co-registration of eye and voice, 79

- defining, 85

- exemplary LMM interaction based on two numeric covariates, 80–82

- word boundaries, identification of, 79–80

- false discovery rate (FDR), 318

- familiarity effect/preference, 14, 15

- familiarization, 98

- familiarization study, 13–14, 15

- habituation techniques, 13–14

- visual preference methods, 23, 30

- Fast Fourier Transform (FFT), 259

- field studies, cross-cultural see cross-cultural field studies

- first pair part (FPP), conversation analysis, 153

- fixations, eye movements, 69, 70, 71

- proportion-of-fixations plots, 100, 101, 102, 104f, 107

- single-fixation duration (SFD), 80–81

- visual fixation time, 22–23, 27

- visual world paradigm (VWP), 90, 100, 101, 102, 107

- fluid-attenuated inverse recovery (FLAIR), 293f, 294, 315

- fMRI see Functional Magnetic Resonance Imaging (fMRI)

- FMRIB Software Library, 301

- fractional anisotropy (FA), 296, 298, 304

- frame-by-frame analysis, 8

- frontal aslant tract (FAT), 292

- Full Width at Half Maximum (FWHM), 274

- functional magnetic resonance imaging (fMRI), xviii, 266, 267–268, 326

- see also functional near infrared spectroscopy (fNIRS); hemodynamic methods

- advantages and disadvantages, 277–278

- apparatus, 267–268

- blood level oxygenation dependent signal (BOLD), 267, 268, 270–272, 275, 277, 279, 280f

- Bonferroni methods, 275

- concepts/description, 266–267

- constraints, 270–272

- data analysis, 273–276

- data collection, 272–273

- edge artefacts, 274

- exemplary study, 276–277

- field of view, 268

- habituation techniques, 3, 4

- head coil, 267

- images, 269f

- magnet, 267

- MNI space, 274

- model-based fMRI, 275

- multiband scan sequences, 270

- multiple comparisons problem (MCP), 275

- scan sequence, 268, 269f, 270

- scanner, 267

- slice-timing correction, 274

- small head movements, correction for, 274

- spatial smoothing, 274

- “standard brain,” 274

- statistical model, 275

- stimuli, nature, 270

- structural priming, 132, 135, 138, 139, 143
Time to Repetition (TR), 268, 270
functional near infrared spectroscopy (fNIRS), xviii, 12, 280

see also functional magnetic resonance imaging (fMRI); hemodynamic methods
advantages and disadvantages, 283–284
apparatus and signal, 278–279
Blood Level Oxygenation Dependent Signal (BOLD), 279
BOLD measured via light absorption, 279, 280
cap, 278, 279
concepts/description, 266–267
data analysis, 282
data collection, 281–282
exemplary study, 283
habitation techniques, 3, 4
instrumentation, 278
interoptode distances, 281
stimuli, nature, 279

genes, 331
candidate genes, 345
FOXP2, implicated in speech and language deficits, 347–348, 349
ROBO2, uncovering effects in early expressive vocabulary, 348–349

genetic architecture, 334
genetic mapping, 331
genome, 331, 333
see also genome-wide association scan (GWAS)
whole exome sequencing (WES), 338–339, 350
whole genome sequencing (WGS), 338, 350
genome-wide association scan (GWAS), 332f, 336, 350
identifying common effects with, 345–346
uncovering effects of ROBO2 gene on Early Expressive Vocabulary, 348–349

genotype (DNA letters), 331, 333, 336, 339, 340f, 369f

genotyping, 337, 339, 340f, 340t, 341, 343, 347, 348

glissade (post-saccadic wobble), 75
Google books, 235
“Google Cardboard,” 177
gradiometers, 261
grammatical morphology, 342
graphic editing, 181
grey matter, 290, 291, 292, 311
Guugu Yimidhir language, Australia, 181
GWAS see genome-wide association scan (GWAS)

Habit software, habituation, 4, 8
habituation curve, 2, 7, 15

habitation techniques, xvii
advantages and disadvantages, 12–15
ANOVA (analysis of variance), 8, 9, 11
apparatus, 3–4
assumptions/rationale, 1–3
audio stimuli, use of, 6
auditory habituation, 3
characters of habituation, 3, 6
comparator model (Sokolov), 2
compared to visual preference methods, 34
concepts/description, 1, 2, 15
Conditioned Head Turn procedure, 13
criteria, 6, 7, 13, 15
data collection and analysis, 8–9
dishabitation, 2, 3, 7
exemplary study, 10–12
and familiarization, 13–14
frame-by-frame analysis, 8
habituation phase, 6–7
habituation-specific software, 8
history, 2, 12
in infants, 1–17
looking time (LT), 1, 4, 6, 8
methodological structure, 6–8
non-habituators, 14–15
preferential looking, 13
pretest and posttest, 6, 8
random habituation, 7
stimuli, 4–5
between-subject design, 7
test, 7
trials, 5, 6, 7, 11
visual habituation, 2
visual stimuli, use of, 5, 13
windows, trials, 6–7
HAL see Hyperspace Analogue to Language (HAL)
Head Mounted Displays (HMDs), 177, 185, 186, 187
Head Turn Preference Procedure (HPP), 13, 18, 20–21, 36
advantages, 34–35
disadvantages, 35–36
exemplary study, 33–34
method/data analysis, 32, 33f
variants, 34
warm-up trials, 32

heart rate, in infants, 2, 4
Hebbian learning, 214, 221, 226
hemodynamic methods, xvii, 266–287
assumptions/rationale, 266–267
electroencephalogram (EEG), 278, 281, 282, 284
functional magnetic resonance imaging (fMRI) see functional magnetic resonance imaging (fMRI)
functional near infrared spectroscopy (fNIRS) see functional near infrared spectroscopy (fNIRS)
hemoglobin, 266, 279, 282
HiDEx software, 215
High Angular Resolution Diffusion Imaging (HARDI), 294, 303, 304
high-attached (HA) expressions, 133, 137
Hilbert transform, 259
hindrance modulated orientation anisotropy (HMOA), 300, 304
HMDs (Head Mounted Displays), 177, 185, 186, 187
HPP see Head Turn Preference Procedure (HPP)
Human Reference Genome, 338
“Human Speechome Project,” 203
Hyperspace Analogue to Language (HAL), 210, 212, 215, 216, 224, 226, 236, 237

IIPLP see Interactive Intermodal Preferential Looking Paradigm (IIPLP)
Iiyama Vision Master Pro 514 CRT monitor, 79
immersive virtual reality (iVR), 174–176, 182–187
see also virtual reality (VR)
independent components analysis (ICA), 254
infants
bilingual, 5, 10, 11
habitation techniques see habitation techniques
heart rate, 2, 4
language discrimination, 5
language perception, 3
perceptual cues, use of, 26
phoneme discrimination skills, 13
phonetic development, 4
phonological development, 4, 12
sucking, 3, 4
visual preference methods, 19

inferenceal statistics
eye-movement tracking, 78–79
word priming and interference paradigms, 123
infrared corneal reflections, eye-movement tracking, 70
infrared Dual-Purkinje image tracking, 70, 90

input devices (motion capture), 176–177
insula, brain, 316
Integrated Development Environment (IDE), 178
interactional phenomenon, 152, 170
Interactive Alignment Model (IAM), 182, 184
Interactive Intermodal Preferential Looking Paradigm (IIPLP)
coding, 26
concepts/description, 36
exemplary study, 26–28
method/data analysis, 25–26
new-label test trial, 27
original-label test trials, 27
purpose, 25
recovery trial, 27, 28

interference paradigms see word priming and interference paradigms
Intermodal Preferential Looking Paradigm (IPLP), 18, 21–25
advantages, 34–35
apparatus, 21–22
“Clever Hans” effects, 22
data analysis, 22–23
disadvantages, 35–36
exemplary study, 23, 24t, 25
and Looking-While-Listening paradigm, 29
method, 21
and Preferential Looking Paradigm, 30
variants, 25–32
visual fixation time, 22–23
intertrial interval (ITI), 271
inversions, DNA, 333
IPLP see Intermodal Preferential Looking Paradigm (IPLP)

language
comprehension see language comprehension
discrimination, in infants, 5
narrow view of, 200
natural language processing (NLP), 209, 233, 242, 243
perception, in infants, 3
production see language production, structural priming
sampling see language sampling
language comprehension
non-behavioral responses, 138–139
overt responses
structure choice, 137–138
temporal measures, 136–137
and production, 42
structural priming, 136–139
Language Development Survey (LDS), 52
language diaries, 44–45
Language in Interaction (research consortium), 197

language production, structural priming, 139–143
non-behavioral responses, 143
overt responses
structure choice, 139–142
temporal measures, 142–143
language registers, 234, 235, 238, 241, 242
language sampling, vocabulary assessment by, 44–50
apparatus, 46–47
assumptions/rationale, 44–46
computer-based analysis systems, 49
concepts/description, 62
data, nature of, 47
data collection, 47–49
dense sampling, 48
and direct assessment, 58
exemplary study, 49
problems and pitfalls, 49–50
Latent Semantic Analysis (LSA), 210, 212, 216, 226, 236, 237
Lateralized Readiness Potential (LRP), 250
learning
associative, 214
cross-situational word learning models, 225
Deep Learning neural networks, 214
Hebbian, 214, 221, 226
supervised, 226
temporal sequence learning networks, 220
unsupervised, 226
Left Anterior Negativity (LAN), 249
LENA (audio-recording technology), 46, 48, 49
lesion overlay maps, 316
lesion studies, xviii, 310–329
advantages and disadvantages, 323–325
alternative methods, 323–325
assumptions/rationale, 311–312
behavioral data analysis, 314–315
behavioral stimuli and response measures, 313–314
concepts/description, 310–311
data collection and analysis, 314–318
exemplary study, 318–323
lesion reconstructions, 315–316, 319–320
neuroimaging data acquisition, 315
patient recruitment and selection, 312
right hemisphere lesions, 312
standardized tests, 313, 314
stimuli and procedures, 319
study design, 312–313
voxel-based lesion analyses, 317–318
voxel-based lesion symptom mapping (VLSM), 321, 322f, 323, 329
lexical decision task, 122
eye-movement tracking, 83–84
latency, 121, 122
word priming and interference paradigms, 121, 122, 124
lexicon see vocabulary
likelihood of the evidence (p/E/H)), 210, 212
Likert scales, 197
linear mixed models (LMMs), 78–79
exemplary interaction, based on two numeric covariates, 80–82
linguistic fieldwork, 193, 204
linguistic relativity, 204
LMMs see linear mixed models (LMMs)
localist representation, 216
log gaze probability ratio, 137
longitudinal research, 46, 47
look-and-listen studies see also looking-while-listening paradigm (LWL)
visual world paradigm (VWP), 90, 94, 95, 107
looking time (LT), 1, 4, 6, 8
looking-while-listening paradigm (LWL), 13, 28–29
  see also look-and-listen studies
coding, 29
exemplary study, 29–30
method/data analysis, 29
low-attached (LA) expressions, 133, 137
low-pass filtering, 22
LWL see Looking-While-Listening Paradigm (LWL)

MacArthur (MacArthur Bates)
Communicative Developmental Inventory (MCDI), 23, 51, 52, 55, 221

McConkie (moving window) paradigm, eye-movement tracking, 68, 72–73, 85

magnetic resonance imaging (MRI), 289, 304, 326
conventional, 290–291
functional see Functional Magnetic Resonance Imaging (fMRI)
lesion studies, 313, 315
MRI-based diffusion tractography, 288, 289
pulse sequence, 292
T1-weighted images, 290, 292, 293f, 294, 305
T2-weighted images, 292, 293f, 294, 305

magnetoencephalography (MEG), xviii, 261, 262
main clause (MC), 133, 136, 139
masked priming paradigm, xviii, 115, 125
Matlab, 181, 215–216, 282
Max Plank Institute for Psycholinguistics, Nijmegen (The Netherlands), 183
mean diffusivity (MD), 295–296, 304
mean length of utterances (MLU), 49
Mechanical Turk (MTurk) see Amazon Mechanical Turk (MTurk)
medial prefrontal cortex, 292
MEG see magnetoencephalography (MEG)
megastudies, 241–242, 243
Microsoft Kinect, 177
middle temporal gyrus (MTG), 319
Mismatch Negativity (MMN), 250, 252
MNI space, 274
MNI template, 326
mobile trackers, 71
model-based fMRI, 275
molecular genetic methods, 330–353
background, 331–332
buccal swabs, 336
cohorts, defining, 342–343
concepts/description, 330–334
data analysis, 343–346
DNA sequencing, 337
DNA variation, 333–334
exemplary studies, 346–349
general approach, 335–336
genetic architecture, 334
genetic variation, characterization techniques, 336–341
genotype, 331, 333, 336, 339, 340f, 341, 343, 369f
genotyping, 339, 340f, 341
GWAS, identifying common effects with, 345–346
linkage analysis implicating FOXP2 in speech and language deficits, 347–348, 349
linkage in large families, 343–345
monogenic traits, xviii, 343–345
multifactorial traits, xviii, 334, 345–346
phenotype collection, 341–342
problems and pitfalls, 349–350
saliva sampling, 336
sequencing, 337–339
monogenic diseases, 334
monogenic traits, 343–345
monomorphemic words, 41, 44
Monte Carlo modeling, 7
mood, and language processing, 180
morphemes, 41
motion-capture (mo-cap), input technology), 176–177
moving window (McConkie) paradigm, eye-moving tracking, 68, 72–73, 85
MRI see magnetic resonance imaging (MRI)
multicollinearity, 51
multifactorial traits, xviii, 334, 345–346
multiparametric methods, 297
multiple comparisons correction procedure, 255
multiple comparisons problem (MCP), 275
multivariate statistics, 68, 83
multi-voxel pattern analysis (MVPA), 275
museum settings, researching
  best practice, 197–198
  disadvantages, problems and pitfalls, 198–199
exemplary studies, 199–200
research rationale, 195–196
myelin, 294, 296, 304

naming task, eye-movement tracking, 83–84
natural language processing (NLP), 209, 233, 242, 243
naturalistic observation, 50
naturally occurring interaction, 170
neural network simulators, 215
neural networks, 225
neuroimaging, structural, xviii, 288–309
  advanced diffusion models, 296–297
  apparatus and data, 292, 293f, 294
  assumptions/rationale, 289–292
  atlasing, 298, 299f
  based on conventional MRI, 290–291
  computerized tomography (CT), 289
  data collection and analysis, 295–300
  diffusion tensor imaging, 295–296
  diffusion-weighted imaging (DWI), 291–292
  evaluation, 301, 303
  exemplary study, 300–301, 302f
  magnetic resonance imaging (MRI), 289
  tract specific measurements, 298, 300
  tractography reconstructions, xviii, 297–298
neuroimaging data acquisition, lesion studies, 315
Neuroimaging Informatics Technology Initiative (NIFTI), 4D, 295
neurotransmitters, 210
newborns, 3
next-generation sequencing (NGS), 336, 337, 338, 339f, 344, 349
next-turn proof procedure, 156, 170
Ngrams, 233
nominals, 62
non-coding DNA, 331
non-invasive brain stimulation (NIBS), 325
non-laboratory settings, 190–207
  best practice, 192–193, 197–198, 201
  cross-cultural field studies, 192–195
  everyday language use, of ordinary people, 191
  exemplary studies, 194–195, 199–200, 202–203
  motivations for being out of the lab, 191
  online studies and museums, 195–200
  rationale, research, 192, 195–196, 200–201
real world settings, conducting studies in, 200–203
research samples, requirements for, 191
non-parametric mapping (NPM), 291
novelty preference, 14, 15, 35

oculomotor programming, 69, 72, 84
1000 Genomes Project Consortium, 333
online studies
  best practice, 197–198
  disadvantages, problems and pitfalls, 198–199
  exemplary studies, 199–200
  rationale, 195–196
  optical eye trackers, 93
  optical sensors, 93
  other-initiation of repair (OIR), 160, 167, 168
  other-initiated self-repair, 154
  output devices, 177
  OxLearn, 215
Parallel Distributed Processing (PDP), 209, 215, 225
parent report, vocabulary assessment by, 50–57
  apparatus/instruments, 52–53
  assumptions/rationale, 50–53
  challenges/related issues, 56–57
  concepts/description, 62
  data, nature of, 54–55
  data collection, 53–54
  exemplary study, 55–56
  motivation to use, in the US, 50
  parsing, 233, 243
  syntactic parsing, xvii, 230
  part-of-speech (PoS), 233
  Peabody Picture Vocabulary Test (PPVT), 57
  perceptual cues, 26
  perceptual span, eye-movement tracking, 68, 69, 72, 73, 83, 85
  perfusion-weighted imaging, 326
  permutation procedures, 255
  p-hacking, 102
  phenotypes, 335, 345
  phenotype collection, 341–342
  phenylthiocarbamide (PTC), 334
  phonemes
    awareness, 342
    connectionist algorithms, 212
    habituation techniques, 2, 13
    monitoring, 125
    speech and spoken language, 96
phonetic development, infants, 4
phonological development, infants, 4, 12
phonological short-term memory, 342
phonology, input and output, 220
phrase-by-phrase self-paced reading, 136
picture naming, 113–114, 120

latency, 117, 122
picture description paradigms, 140, 141
picture-matching tasks, 140–141
structural priming, 140
word priming and interference paradigms, 113–114, 117, 120, 122
Picture Vocabulary Test, 59
picture-word interference paradigm, 125
PLP see Preferential Looking Paradigm Without Language (PLP)
point-of-disambiguation (POD), visual world paradigm, 92, 107
polymerase chain reaction (PCR), 337
polymorphisms, 333, 339
position, conversation analysis, 170
Positron Emission Tomography (PET), 271, 277
posterior probability (p(H/E)), 210, 211–212
post-mortem dissections, 292
Power Glove (Nintendo), 176
Praat software, 79–80, 116, 181
predicates, 41, 62
preferential looking, 13
Preferential Looking Paradigm Without Language (PLP), 21
exemplary study, 31–32
and IPLP studies, 30
method/data analysis, 30–31
salience trial, 30
test trials, 30
Prepositional Object (PO), 133, 143, 145
presence, virtual reality, 175, 179, 187
Presentation® software, 115
pre-supplementary motor cortex, 292
preview benefit, Rayner boundary, 74
primary progressive aphasia (PPA), 291, 299f, 312
priming see also structural priming; word priming
and interference paradigms
comprehension, 133, 146, 148
cross-modal, xviii, 256
data loss, 146
definition of “prime,” 125, 148
inhibition, involving, 148n1

masked, xvii, 115, 125
near-threshold, 82
parafeveal fast-priming, 74
production, 142–143, 146, 148
semantic, 199
syntactic, 148
prior probability of the hypothesis (p(H)), 210, 212
probabilistic approach, computational modeling, 209–210, 215, 218–220
algorithms, 211–212
production priming, 142–143, 146, 148
production studies
electrophysiological methods, 252–253
hemodynamic methods, 271
structural priming, 135
visual world paradigm (VWP), 92, 98, 99, 102
profile analysis, 58
proportion-of-fixations plots, visual world paradigm, 100, 101, 102, 104f, 107
Proteus Effect, 179
proton density, 292
prototypes, 43
prototypes, 43
prototypic, 43
psychophysiological responses, 2
pulse sequences, 292, 304
pupil-corneal reflection vector, 74
Purkinje images, 71
Python programming language, 178, 179
quantitative research methods, conversation analysis (CA), 167–168
Quick Interactive Language Screener (QUILS), 35, 59
radial diffusivity (RD), 296, 304
radiofrequency (RF), 292
rapid automatized naming, 342
rapid serial visual presentation (RSVP), 84, 85, 138
Rayner (boundary) paradigm, eye-movement tracking, 68, 73–74, 85
reaction times (RTs), adult readers, 214
reading
see also eye movements; eye-movement tracking, during reading
eye-movement tracking, 68–88
apparatus, 70–71
assumptions/rationale, 68–70
data collection, 74
exemplary study, 79–82
experimental paradigms see under
  eye-movement tracking, during
  reading
  stimuli, 72
  eye-voice span (EVS), 79–82
    co-registration of eye and voice, 79
    word boundaries, 79–80
  natural, 69, 70, 84
  perceptual span, 68, 69, 72, 73, 83
  phrase-by-phrase self-paced reading, 136
  reaction times (RTs), adult readers, 214
  reading aloud (oral reading), 68, 79–82,
    113–114
  second-pass, 76
  self-paced, 84, 85, 136
  silent, 79
  whole-sentence reading, 136
  real world settings, conducting studies in,
    200–203
  best practice, 201
  disadvantages, problems and pitfalls,
    201–202
  exemplary studies, 202–203
  rationale, 200–201
  Receptive and Expressive One Word
    Vocabulary Test (ROWPVT/ EOWPVT), 57
  recessive monogenic inheritance, 345
  recognition memory tasks, 140
  reduced relative clause (RR), 133,
    136, 139
  reference electrodes, 251
  regions of interest (ROIs), 136
    hemodynamic methods, 277, 281, 283
    structural neuroimaging, 290, 300
    visual world paradigm (VWP), 92, 93,
      99, 101
  repair practices, conversation analysis,
    153–154, 159
  other-initiation of repair (OIR), 160,
    167, 168
  self-initiated self-repair, 153, 159
  repetition time (TR), 292, 304
  response-contingent analyses, 94
  resting state functional magnetic resonance
    imaging (rsfMRI), 325
  ROBO1 gene, 341
  ROBO2 gene, uncovering effects in early
    expressive vocabulary, 348–349
  ROIs see regions of interest (ROIs)
  RSVP see rapid serial visual presentation
    (RSVP)
  saccade detection, 75, 85
    velocity-based, 355f
  saccades
    see also eye movements; eye-movement
      tracking, during reading
  eye-movement tracking, during reading
    eye-voice span (EVS), 79–82
    co-registration of eye and voice, 79
    word boundaries, 79–80
    natural, 69, 70, 71, 75, 79, 85
    post-saccadic wobble (glissade), 75
    visual world paradigm (VWP), 102, 103,
      106, 107
  salience
    feature-based, 97
    perceptual, 28
  trials, 23, 27, 30
    visual preference methods, 23, 27, 30
    visual world paradigm (VWP), 96, 97
  Same and Switch trials, habituation, 11
  Sanger sequencing techniques, 337, 338f,
    344, 347
  scaling problem, 200
  scan-path analysis, 79
  scripted interactions, 154
  search coils, eye-movement tracking, 70
  second pair part (SPP), conversation
    analysis, 153
  segmentation mask, 290, 304
  selection, in genetics, 333–334
  self-initiated self-repair, 153, 159
  self-organizing map (SOM), 213,
    214, 226
  DevLex-II model, 220
  SOMToolbox, MatLab, 215
  self-paced reading, 84, 85, 136
  semantic analysis, xvii
  semantic priming, 199
  semantic structure, 192
  semantic vectors, 235–237, 243
  sentences
    CDI:Words & Sentences (CDI:WS), 52,
      55, 56
    processing difficulty, 106
    sentence recall paradigms, 141, 142f
    sequencing, 338
    small clause sentences, 143,
      144f, 145f
    as stimuli, xvii
    whole-sentence reading, 136
  sequence organization, conversation
    analysis, 153
  sequencing, genetic methods, 337–339
  Simple Recurrent Network (SRN), 213,
    214, 226
single nucleotide polymorphisms (SNPs), 339, 340f
SNP chips, 341, 343, 344, 345, 348
single-fixation duration (SFD), 80–81
Singular Value Decomposition (SVD), 212, 236
slice-timing correction, 274
small clause sentences, 143, 144t, 145t
Snap paradigm, 141
SNPs see single nucleotide polymorphisms (SNPs)
SOM see self-organizing map (SOM)
spatial resolution, xviii, 93, 254–255, 279, 284, 304
good quality, 268, 277, 284, 315
high, 266, 274
low, 92, 315
neuroimaging, 289, 290, 293f, 301
spatial smoothing, 274, 290, 304
specific language impairment, 342
spectrogram, 259
speech and spoken language
see also conversation analysis (CA)
acoustic cues, 95, 96
childhood apraxia of speech (CAS), 341, 347
co-articulation, 96
errors, 231
FOXP2 gene, in speech and language deficits, 347–348, 349
lesion studies, 311–312
onset latencies, 115, 116
rate and pitch, 182
segmentation of speech stimuli, 98
source of speech, 93
visual world paradigm (VWP), 93, 95–96
speech-recognition software, 46–47
Standard Average European (SAE), 192, 204
standard space, 274, 290, 301, 304
standardized assessment manuals, 60
standardized template, 315–316, 317f, 363f
standardized tests, 234, 341
lesion studies, 313, 314
vocabulary assessment, 49, 57–61, 62
statistical analysis
analysis of variance see analysis of variance (ANOVA)
cocurrence statistics, 210, 215, 216, 218
Functional Magnetic Resonance Imaging (fMRI), 275
inferential statistics, 78–79
linear mixed models (LMMs), 78–82
multivariate statistics, 68, 83
nonlinear mixed models, 78
probabilistic approach see probabilistic approach, computational modeling
quantile regression analysis, 78
scan-path analysis, 79
survival analyses, 78–79
visual preference methods, 22, 34
visual world paradigm (VWP), 101–103
stimulus timing, word priming, 119–120
stimulus-onset asynchrony (SOA), 114, 120, 125
streamlines, 296, 297, 299f, 300, 305
stroke, 294, 326
structural neuroimaging see neuroimaging, structural
structural priming, xviii, 130–150
apparatus and test tools, 132
assumptions/rationale, 131–132
Baselines, 143
Blood Level Oxygenation Dependent Signal (BOLD), 132, 139, 143
corcepts/description, 130–131
data collection and analysis, 136–143
data types, 135
Double Object (DO), 133, 136, 137, 143, 145
event-related potentials (ERP), 132, 135, 138, 139
exemplary study, 143–145
experimental design, 147
experimental stimuli, 135
Functional Magnetic Resonance Imaging (fMRI), 132, 135, 138, 139, 143
of language comprehension, 136–139
of language production, 139–143
nature of stimuli and data, 132–135
non-behavioral responses, 138–139, 143
overt responses
structure choice, 137–138, 139–142
temporal measures, 136–137, 142–143
picture description paradigms, 140
Prepositional Object (PO), 133, 143, 145
prime/target expressions, 133, 134t, 147
priming effects, 131
problems/pitfalls, 145–147
response latencies, 143
small clause sentences, 143, 144t, 145t
structure choice, 137–138, 139–142
syntax, 131, 132, 133, 134t, 146
targets, 133, 134t, 141–142, 148
temporal measures, 136–137, 142–143
SUBTLEX frequencies, 235, 239
SuperCoder (freeware), 8
superconducting quantum interference
devices (SQUIDs), 261
superior temporal gyrus (STG), 319
superordinates, 43
supervised learning, 226
support vector clustering (SVC), 219
surface electrodes, eye‐movement
tracking, 70
surface‐based morphometry (SBM),
290, 291
surveys, 197
Switch procedure, 5, 10, 15
synapses, 210, 211
syntactic parsing, xvii, 230
syntactic priming, 148
syntactic structure, 131–132
Syntactic Structures (Chomsky), 19
syntax, xvii, 53, 96, 161, 193, 215, 249
interrogative, 161
structural priming, 131, 132, 133,
134t, 146
Systematic Analysis of Language Transcripts
(sALT), 48
T1‐weighted images, 290, 292, 293f,
294, 305
T2‐weighted images, 292, 293f, 294, 305
tagging, 233, 243
talk
see also conversation analysis (CA);
speech and spoken language
overlapping, 152
as vehicle for action, 153
TalkBank website, 46
targeted language games, 105, 106
targets
prime/target expressions, in structural
priming, 133, 134t, 147
structural priming, 133, 134t,
141–142, 148
visual world paradigm (VWP), 92, 107
word priming and interference paradigms,
118, 120, 125
TAS2R38 receptor, 334
temporal sequence learning networks, 220
Tests of English as a Foreign Language
(TOEFL), 236, 237
time series analysis, 282
time‐frequency analysis, 259
time‐locking eye movements, 95–96
Total Conceptual Vocabulary, 53, 62
touch screen technology, 59
tractography reconstructions, xviii,
297–298, 305
transcranial direct current stimulation
tDCS), 325, 326
transcranial magnetic stimulation (TMS),
324, 325, 326
transcription
conventions, 155, 157–158
conversation analysis (CA), 155
language sampling, 48, 49–50
transition‐relevance place (TRP), 153
translocation, 347, 351
Truth‐Value Judgment task, 137, 138
turn design, conversation analysis,
153, 164
turn‐constructional units (TCUs), 153
turn‐initial particles, 161
turn‐taking procedures, 153
type‐token ratio of words (TTR), 49
Tzeltal language, Mexico, 181
uncanny valley, virtual reality, 186, 187
unsupervised learning, 226
validity
ecological, 168, 203
external, 190, 204
video‐based eye tracking, 70, 71, 85
video‐recording technology/video cameras,
4, 93, 154
vocabulary assessment, 45, 46
virtual reality (VR), 174–189
advantages and disadvantages,
185–186
agents, 178, 183–187
apparatus, 176–179
assumptions/rationale, 174–175
avatars, 179–180, 187
data, nature of, 181
data collection and analysis, 181
emotional realism, 185
environment, manipulating parameters of,
180–181
evaluation, 186–187
exemplary studies, 182–184
Head Mounted Displays (HMDs), 177,
185, 186, 187
virtual reality (cont'd)

immersive virtual reality (iVR), 174–176, 182–187
input devices (motion capture), 176–177
integrating input and output, 178–179
markers, active and passive, 176
moving through the virtual world, 178
output devices, 177
participant pool, expanding, 185
presence, 175, 179, 187
reproducibility of complex environments, 185–186
stimuli and data, 179–181
uncanny valley, 186, 187
virtual people, manipulating parameters of, 179–180
Vizard VR software, 178–179, 180, 183
VIRTUO/A characters, virtual reality, 183, 184
visual fixation time, 22–23, 27
visual habitation, 2
visual preference methods, xvii, 18–39
assumptions/rationale, 20–21
concepts/description, 18–19
development, 19–20
Headturn Preference Procedure (HPP), 32–34
Interactive Intermodal Preferential Looking Paradigm (IILP), 25–28
Intermodal Preferential Looking Paradigm (IPLP), 21–25
Looking-While-Listening Paradigm (LWL), 28–32
Preferential Looking Paradigm Without Language (PLP), 30–32
purpose, 18–19
visual fixation time, 22–23, 27
visual stimuli, use, of habituation techniques, 5, 13
visual world paradigm (VWP), xviii, 89–110
see also eye movements; eye-movement tracking, during reading
acoustic cues, 95, 96
advantages and common applications, 105–106
apparatus, 92–93
assumptions, 92
coding, 99
competitors, 92, 107
“hidden competitor” designs, 106
concepts/description, 89, 89–91, 107
data collection and analysis, 99–103
design and interpretation, general
considerations affecting, 95–97
disadvantages and limitations, 106
distractor, 98, 107
example study, 103–105
experimental paradigms, 92
eye movements in natural tasks, 96–97
language, 93
linguistic stimuli, 98
linking hypothesis, 91–92
logic, 91
look-and-listen studies, 90, 94, 95, 107
point-of-disambiguation (POD), 92, 107
production studies, 92, 98, 99, 102
speech and spoken language, 95–96
statistical analysis, 101–103
stimuli, nature, 97–99
and structural priming, 136, 137
targets, 92, 107
task-based, 94–95, 107
terminology, 92
timing, 98–99
variations across experiments, 93–95
visual world, 94, 97–98
visualization, 100–101
workplace characteristics, 94
vocabulary
as antecedent, 41–42
assessment, 40–66
apparatus, 46–47, 52–53, 59
assumptions/rationale, 44–46, 50–51, 58–59
challenges/problems, 49–50, 56–57, 61
core issues, 43–44
data, nature of, 47, 54–55
data collection, 47–49, 53–54, 59–60
direct, 58–61
exemplary studies, 49, 55–56, 60
language sampling, 44–50
methods, 40
by parent report, 50–57
standardized tests, 49, 57–61, 62
as consequent, 42
meaning, 42–43
as object of study in its own right, 41
purposes of studying/assessing, 41–42
Total Conceptual Vocabulary, 53, 62
word knowledge, managing, 42–43

VLSM see voxel-based lesion symptom mapping (VLSM)
vocal cord vibrations, 3
voice-onset time (VOT) competitors, 92
voxel-based lesion analyses, 317–318
voxel-based lesion symptom mapping (VLSM), 291, 313, 317–318, 326 analyses, 323
correlates of auditory word recognition, 321, 322f
summary, 323
voxel-based morphometry (VBM), 290, 291, 324, 326
VWP see visual world paradigm (VWP)

WAV audio files, 181
Wernicke’s area, 292, 319
Western Aphasia Battery (WAB-R), 300, 319
white matter, 290, 291, 292, 302f, 311
whole exome sequencing (WES), 338–339, 350
whole genome sequencing (WGS), 338, 350
whole-sentence reading, 136
Wikipedia, 235, 238
word boundaries, eye-movement tracking, 73, 79–80
word frequency, 51, 234–235, 243
word knowledge, managing, 42–43
word priming and interference paradigms, xvii, 111–129
see also priming
apparatus, 115–116
associatively related primes, 118
assumptions/rationale, 112
blocking paradigms, 120, 124
category-congruent and incongruent primes, 116, 118
concepts/description, 111–112
data analysis, 121–123
designing of priming experiments, 116–121
evaluation, 123–124
exemplary studies, 112–115
goal of word priming studies, 112, 115
lexical decision task, 121, 124
masked priming paradigm, xviii, 115, 125
modality, 116
participants, 121
phoneme monitoring, 125
picture naming, 113–114, 117, 120
picture-word interference paradigm, 125
presentation time of primes, 119
priming effects, 117
properties of primes/targets and prime-target combinations, 116–119
prototypical priming, 112
related and unrelated primes, 118
response latencies, 115, 116, 117, 121, 122
stimulus timing, 119–120
stimulus-onset asynchrony (SOA), 114, 120, 125
targets, 118, 120, 125
task, 121
word-association studies, 242
Wordbank, 55
Wordnet, 242, 243
word-object associative skills, 5, 10, 11
word-referent links, 1
words
categories of, 43, 44
closed-class, 41, 62
color, 42
common versus rare, 44
compounds, 44
connotations, 43
cross-situational word learning models, 225
denotation, 43
derived, 44
dictionary entry, 43, 44
monomorphemic, 41, 44
multiple meanings, 43
recognition see word recognition
target words, 230, 237
type-token ratio of words (TTR), 49
World Wide Web, 238

XML programming language, 199
Yu and Ballard model, computational modeling, 218–220
Zipf-value, 234, 235, 239