Index

ABMs see agent-based models (ABMs)
academic geography 6, 11
access technology (AT) 283–4
information
BlindSquare 282
designing for future 283–4
overview 281–2
Sendero group 282
acquisition of cognitive maps 116, 137
idea of cognitive maps 116–17
individual differences in 129–33
large-scale spaces 117–18
spatial knowledge 119–24
spatial learning 135
training and instruction of 133–4
see also spatial knowledge
activity-based models 63–5
activity-based travel demand models 89
activity space 90
adaptive structuration theory (AST) 47–8
affordances
notion of 28
role of 149
Agarwal, P. 13, 216, 292
agent-based models (ABMs) 47
behavioral decision theory and 50–51
spatial 51
Agnew, J. 302
allocentric reference frame 215, 278
amodal spatial representations 270–74
analogical bootstrapping 380, 381
analytical time geography 80–81
information and communication technologies 87
mobility data collection 81–2
network time prisms 84–6
path analytics 82
prism analytics 82–4
types of prisms 86–7
anchor-point theory 120–21
Antes, J.R. 248
Appleton, J. 310, 312, 316
ArcGIS 191
architectural cognition and behavior
aesthetics 339–40
approaching and entering a building 342–7
habitual path (path following) 349
looking at buildings 341
overview of 337–8
path finding 347–9
task-dependent traversing and building exploration 349–52
users interaction with buildings 339
Architecture of Happiness, The (de Botton) 345
Aristotle 8
Armstrong, M.P. 359
ART see attention restoration theory (ART)
Arthur, P. 342, 343
artificial intelligence (AI)
behavioral geography and 361, 362
counter-human interaction 364–5
cyber-physical systems 365–6
machine and computer vision 362–3
robotics 363
virtual geographic environments 363–4
virtual worlds 363–4
development of 357
of human-centered computing 361
for informatics 361
intelligence in 358
and 20th century geography 358–60
artificial thinking 359
assistive technology 281
AST see adaptive structuration theory (AST)
attention restoration theory (ART) 316–17
attitude 9, 13
attraction accessibility measures 88
authority constraints 64, 76
automated geography 358
Baker, R.R. 396–9
Barrett, L. 393, 395
Baumgarten, A. 308
Bayesian framework, integrating information 106–7
BB see Brownian Bridge (BB)
Becker, G.S. 64
behavior 9, 13
concepts of 8–10
behavioral decision theory, in spatial decision-making models 41–2
agent-based models and 50–51
bounded rationality 44–5
multiple criteria decision making 48–50
prospect theory 45–6

407

Daniel R. Montello - 9781784717544
Downloaded from Elgar Online at 04/15/2019 07:47:00AM
via free access
rational decision-making model 43–4
see also spatial decision-making models
behavioral geography 4–5
characteristics of 5
criticism 6–7
description 3–4
domain and approach of 4–8
implications for 30–33
terminology 7–8
behavioralism 155–6
criticism 156
behaviorism 7, 22–3
Benedikt, M.L. 348
Benesh, N. 221
Bertin, J. 181
biological factors, gender differences 252–3
Blaut, J.M. 25
blind and visually impaired (BVI) 261, 262,
264, 268, 283
blindness, traditional classifications of 262–5
blind spatial cognition
amodal spatial representations 270–74
blind and visually impaired population size
262
functional equivalence 270–74
information access technology 282–3
legal blindness 261–2
models
deficiency/cumulative 266
difference/convergent 267–8
inefficiency/persistent 266–7
original formulation of 266
orientation and mobility training 265
overview 260–61, 276–7
perceptual vs. cognitive focus 276
space as common denominator 269–70
spatial scale and frames of reference
277–8
traditional vs. functional classifications of
262–5
visual vs. nonvisual information 274–6
visuocentrism, problem of 268–9
BlindSquare 282
Boone, A.P. 13
bootstrapping process 380–81
border (boundary) cells 98, 99, 158
bottom-up approach 395
Boulding, K. 25–6
bounded rationality 17, 44–6, 63, 392
brain imaging technologies 400–401
brain scanning 190–91
brain’s positioning system 154
Brettel, A. 344
“Brexit” referendum 185, 186
broad comprehensive cognitive maps 23
Brockman, J. 390
Brownian Bridge (BB) 84
Brunyé, T.T. 12
Bryant, K.J. 232, 233, 273
 Bundling 79
Burgess, N. 108, 398
Burke, E. 308
Burns, L.D. 80, 88
Burte, H. 13
Burton, I. 391
BVI see blind and visually impaired (BVI)
California Household Travel Survey 71
Campbell, D.T. 14n1
Canter, D. 299
capability constraints 64, 76
cardinal-direction strategy 239, 240
Carey, S. 380
cartographers 178, 181, 185, 186
cartographic abstraction process 180
cartographic design, as cognitive process
180–81
cartography 5
cognitive research in 187–8
cognitive study of 179–80
caudate nucleus 164–6
cellular automata-based simulation 52
Central Place Theory 46
count-based recording 81
Chang, K.-T. 248
Chapin, F.S. 63–4
Ching, F.D.K. 342, 343
Choi, J. 253
Choi, Y.K. 349
Chomsky, Noam 23
Christaller, W. 46, 301
chronic hazards 322
Cicero 16
city environments, elements of 119
classical cognition 27–8
complexity theory 28–30
embodied cognition 28
neo-connectionism 28
parallel distributed processing 28
classical conditioning 23
classical time geography
degree of flexibility 76
individualistic space–time constraints 76
shared activities and time markets
78–80
space–time paths 76–7
space–time prisms 77–8
time and space as scarce resources 75
see also analytical time geography
climate change perceptions 327–9  
cognition 9, 177  
*Cognition of Geographical Space, The* (Kitchin and Blades) 24  
cognitive geography 3, 24  
characteristics of 5  
criticism 6–7  
description 3–4  
domain and approach of 4–8  
jimage and environment 24  
implications for 30–33  
key tenets of 33  
research topics of 33  
terminology 7–8  
cognitive (or semantic) landmark 145  
cognitive linguistics 212  
cognitive map-design research 178–9  
*Cognitive Mapping* (Kitchin and Freundschuh) 24  
cognitive maps 17–19, 30, 98, 177–8  
behavioral geography 25–7  
development 284  
in men 24–5  
cognitive maps, acquisition of 116, 137  
idea of cognitive maps 116–17  
individual differences in 129–33  
large-scale spaces 117–18  
spatial knowledge 119–24  
spatial learning 135  
spatial thinking 135–6  
training and instruction of 133–4  
see also spatial knowledge  
“Cognitive Maps in Rats and Men” (Tolman) 141  
cognitive neuroscience 154–5, 400–401  
of geographic spatial thinking 165–8  
of navigation 157  
at cellular level 157–8  
pay integration 161–2  
place learning and goal-directed navigation 162–4  
response-based navigation 164–5  
scene-processing network 159–61  
positivism in geography and 155–7  
cognitive place 298–9  
cognitive processes  
emotion 187  
perception and attention 183  
reasoning with maps 184–7  
relevant to map 183–91  
research themes 187–9  
spatial memory 183–4  
cognitive processing mechanisms 111  
cognitive psychology 214  
cognitive region 16  
cognitive science 22, 155  
behaviorism 22–3  
cognitive revolution 23  
cognitive strategies vs. perceptual information 276  
collective memory 301  
Collen, A. 346  
*Complexity, Cognition and the City* (Portugali) 35  
complexity theory 28–30  
of cities 29  
computational process models (CPM) 66–7  
*Computer and the Brain, The* (Neumann) 23  
computer-human interaction 364–5  
computer vision 362–3  
concept-matching process 201  
Conference on Spatial Information Theory (COSIT) 27  
configurational knowledge 119, 124, 233, 248, 250  
congenital adrenal hyperplasia 252, 253  
conjunctive cells 98, 158  
*Construction of Cognitive Maps, The* (Portugali) 24  
Consumat ABM 51  
consumer surplus 88  
*Continuity of the Mind, The* (Spivey) 29  
continuous theories, stage theories and 122  
core-satellite design 70  
COSIT see Conference on Spatial Information Theory (COSIT)  
Cossins, D. 399  
Couclelis, H. 87, 294, 360  
coupling constraints 64, 76  
CPM see computational process models (CPM)  
*Crabgrass Frontier, The* (Jackson) 330  
crowd-sourcing, benefit of 146  
cryptochrome 399  
cue integration 107  
Cullen, I. 64  
cultural ratchet 379  
cyber-physical systems 365–6  
Dalton, R.C. 13  
Davies, C. 12  
Davis, A.J. 330  
decision making, theories and concepts of 42, 52  
bounded rationality 44–5  
concepts in geography 46–8  
prospect theory 45–6  
rational decision-making model 43–4  
declarative knowledge 299  
deficiency/cumulative model 266  
degrees of freedom 295
early geographic education
- bootstrapping process 380–81
- children's understanding of place 376
- and cognitive development 373
- developmental theory 379–81
- external spatial representations 376–8
- goals and methods of 383
- implications and recommendations for 382–3
- implicit geographic knowledge 378–9
- large-scale space 375
- maps, space, and place, teaching about 383
- place 373–4
- small-scale space 374–5
- spaces 373
- and spatial knowledge 376

EAST see enhanced adaptive structuration theory (EAST)

Eckert, M. 178
edges 119
Edwards, W. 44
Egenhofer, M.J. 217, 365
egeocentric reference frame 214, 277–8
electroencephalography (EEG) 400
electrophysiological studies 164
Ellis, W. 389, 403
embodied cognition 28, 31
Emo, B. 344
emotions 9, 13, 187
engineering trap 281–2
enhanced adaptive structuration theory (EAST) 48
entorhinal cortex 252
Entrikin, J.N. 293, 301
environmental aesthetics
- affordance approach 312–13
description of 307–8
- evolutionary approaches to 309
- habitat selection theory 310–11
- information processing 314–17
- natural and built environments 309
- prospect-refuge theory 312
- psychological approach 308–9
- stress reduction 313–14
environmental approach 394
environmental attitude 9
environmental decision making 109–10
environmental determinism 16
environmental geometry 99, 100, 109
environmental knowledge 97
- conceptuating 108
- environmental structures 99–100
- information processing 100
- encoding and retrieving information sources 100–102
- goal-directed processing 105–6
- integrating information 106–7
- orienting 103–5
- perceptuomotor processing 102–3
- measures of 233
- neural structures 98–9
- representing and using 107–8
- combined representations of spatial information 108
- environmental decision making 109–10
- route planning 109–10
- environmental models 393
- environmental possibilism 16
- environmental risks and hazards
  - chronic hazards 322
  - climate change perceptions 327–9
  - heuristics 326
  - residential water conservation 329–31
  - resilience 323
  - risk perceptions and behaviors 324–6
  - social amplification 327
  - sudden onset hazards 322
  - and sustainability 323–4
  - vulnerability 323
- environmental scale 277
- environmental-scale spaces 383
- environmental spaces 104, 118, 231, 277, 373, 378
- environmental spatial ability 231
- environment perception 118
- environments, spatial layout of 11
- error-prone cognitive matching process 206
- ethnogenesis 122
- Evans, G.W. 312
- event-based recording 81
- expected-utility model 43
Index

experiential place 300–301
experiential realism 28, 30–31
experimental control 156
experimental-manipulative method 394
external spatial representations 376
geographic maps 377–8
mapping spatial relations 377
eye movements 190

Fabrikant, S.I. 12
Fields, A.W. 238
field time prism (FTP) 86
figural space 118, 231, 277, 373
Fletcher, J.F. 266
fMRI see functional magnetic resonance imaging (fMRI)
four-step travel demand model 89
Fractal Geometry of Nature (Mandelbrot) 29
Fragebogen Räumliche Strategien (FRS) 240
frames of reference 277–8
Frank, A.U. 213
French, S. 357
Freundschuh, S. 198
FRS see Fragebogen Räumliche Strategien (FRS)
FTP see field time prism (FTP)
functional classifications of blindness 262–5
functional equivalence, of spatial behaviors 270–74
functional magnetic resonance imaging (fMRI) 190, 400

Gardner, H. 22, 24
Gardony, A.L. 12
gaze direction 190
GazeNav approach 206
gender differences 247
biological factors 252–3
on map reading skills 248–50
small-scale spatial abilities 252
sociocultural factors 251–2
wayfinding strategies 250–51
see also sex differences
gender stereotyping
of geographic abilities 252
of navigational abilities 252
geodemographics technology 403
Geographica (Strabo) 16
“Geographical Analysis Machine” (Openshaw) 359
geographical information systems (GIS) 27, 154–6, 197, 200
geographical information theory 292
geographical space 41, 42, 277, 293
geographical terminology 212
geographic information science (GIScience) 5, 12, 180, 191, 402
geographic information technologies 197, 292
cognition
empirical studies 201–2
examples 204–5
formal theories, models, and tools 201
gaze-based navigation 206
human-computer interaction 199–200
mobile eye-tracking 202–4
spatial cognition 198, 200
spatial learning 198–9
wayfinding with landmarks 205
geographic knowledge 247–51, 359
development of 378
geographic place 299 see also place
geographic positioning systems (GPS) 362
receivers 74, 81
technology 197
geographic scale 61
geographic space 60, 118, 215, 217, 248, 373, 379
maps and diagrams 220–22
navigation in 218–20
geographic spatial thinking, cognitive neuroscience of 165–8
geography
decision theories and concepts in 46–8
positivism in 155–7
quantitative revolution in 16
as spatial science 16–17
structuralist–Marxist–humanistic revolution in 20–22
geography of language see language of geography
geolinguistics 211
geometric space 293
geospatial revolution 401–3
geospatial technologies 135–6
geospatial thinking skills 165
neuroscience in 166
geovisualizations 184, 185, 191
Gersmehl, C.A. 165, 166
Gersmehl, P.J. 165, 166
Gibson, J.J. 28, 201, 308, 312, 348
Gillespie, W.T. 249
GIS see geographical information systems (GIS)
GIScience 5, 12, 180, 191
technologies 402
Giudice, N.A. 13
global-egocentric strategies 239, 240
global reference frame (GRF) 103, 104
goal-directed navigation 162–4
goal-directed processing 105–6
human behavioral sciences 3
human behavior in space 16
human-computer interaction (HCI) 199–200
human geography 5, 11, 20, 34, 247, 300
humanized space 293, 301
Human Navigation and Magnetoreception (Baker) 398–9
Human Navigation and the Sixth Sense (Baker) 396
human navigation, cognitive aspects of 141, 143–4
cognitive tools for wayfinding 149–50
ecological approach and role of affordances 149
indoor navigation 148
landmarks in wayfinding 144–7
measure usefulness 142–3
model of navigation 143
nature of directions 141–2
orientation in wayfinding 147–8
useful directions 142–3
Hutchins, E. 198
hybrid-choice models development 63
ICT see information and communication technologies (ICTs)
IGI see involuntary geographic information (IGI)
Image and Environment (Downs and Stea) 24–6
image, notions of 26–7
Image of a City, The (Lynch) 17, 20, 25
Image, The (Boulding) 25, 26
implicit geographic knowledge 372, 376
development of 373, 378–9
imprecise navigators 235
indifference curves 43
individual differences
in large-scale spatial abilities see large-scale spatial abilities
in navigation ability, evidence for large 234–5
navigation strategy
objective measures 240–42
self-report measures 239–40
in spatial abilities 231
and strategy 239–42
individual–group dynamic methods 82
individualistic space–time constraints 76
indoor navigation, interfaces for 149–50
indoor path finding 347–8
inefficiency/persistent model 266–7
information access technology (AT) 282
BlindSquare 282
designing for future 283–4
Manual on Uniform Traffic Control Devices 142
maps 101, 177–8
cognition by children 189
cognitive processes
emotion 187
perception and attention 183
reasoning with maps 184–7
research themes 187–9
spatial memory 183–4
design 179
perception and cognition, empirical methods 189–90
brain scanning 190–91
gaze direction and eye movements 190
physiological measures 191
web analytics 190
projections 178
psychology 179
Maps in Minds (Downs and Stea) 24, 26
Mark, D.M. 216, 365
Markov techniques 85
Markus, T.A. 350
Marr, D. 343
Massey, D. 291, 296, 301, 302
Mavridou, M. 344
McClelland, J. 28
MCDM see multiple criteria decision making (MCDM)
McGuiness, D. 249
mean absolute errors 127–8
measurement error 82
measuring pragmatic information, theory for 201
medial temporal lobes (MTL) 154, 157, 161–3
mediation model 238
mental maps 17–18
Mental Maps (Gould and White) 17
Mesch, G.S. 300
message windows 87
microgenesis 121–2
Miles’s law 18
Miller, H.J. 11
mind
brain and 9–10
concepts of 8–10
mobile eye-tracking 202–4
mobility data collection 81–2
mobility training 265
MODM see multiple objective decision making (MODM)
moment-based descriptors 82
Montello’s model of psychological space 277
Moser, E.I. 34, 154, 395
Moser, M.-B. 34, 154, 395
MTL see medial temporal lobes (MTL)
multiple attribute decision making (MADM) 49, 50
multiple criteria decision making (MCDM), behavioral decision theory and 48–50
multiple objective decision making (MODM) 49, 50
multivoxel pattern analysis (MVPA) 159, 160, 162
MVPA see multivoxel pattern analysis (MVPA)
narrow strip cognitive maps 23
National Research Council, spatial thinking 135
naturalistic decision making 42
natural language
allocentric reference frame 215
and cognition 212–13
egocentric reference frame 214
of geography 216–18
intrinsic reference frames 214, 215
metaphorical structures in 212
relative reference frames 214, 215
of space 213–16
spatial concepts in 214
navigation 100–101, 157
cognitive neuroscience of 157–65
environmental knowledge and 105
general model of 143, 144
goal-directed 162–4
indoor 148
place learning and 162–4
response-based 164–5
tools for 135
see also human navigation
Neisser, U. 29
neo-connectionism 28
network time prism (NTP) 84–6
neuroscience
cognitive see cognitive neuroscience
Newcombe, N.S. 107, 133
Newell, A. 201
Newtonian model 293
nodes 119
Noesselt, T. 273
non-computational things 361
non-integrators 235
non-player characters (NPCs) 364
non-spatial properties 5
non-visual information processing 282
non-visual screen-access technology 264
non-visual spatial technologies 263
prospect-refuge theory 312
prospect theory 45–7, 63, 325
proximity measures 88
psychogeography 8
psychological geography 8
psychological space 118, 155–6
Montello’s model of 277
public health, time geography and 89–90

Questionnaire on Spatial Representation (QSR) 239–41
radical transformations, in knowns and unknowns 399–403
Raento, P. 252
random utility models (RUM) 62
Rasmussen, S.E. 346
rational decision-making model 43–5, 49, 62
Ratliff, K.R. 107
Ratzel, F. 16
Raubal, M. 12, 201
realized place 294
realized space 293, 295, 296
regional geography 16
relative reference frame 214, 215
Relph, E. 20, 295, 296, 300, 301
residential water conservation 329–31
response-based navigation 164–5
retrosplenial complex (RSC) 159–60
Richter, K.F. 218
risk perceptions and behaviors 324–6
robotics 363
Rosch, E. 212
rough set theory 83
route knowledge 119, 142, 233
vs. survey knowledge 278–9
route planning 109–10
route strategy 239
RSC see retrosplenial complex (RSC)
RUM see random utility models (RUM)
Rumelhart, D. 28
Rumsfeldian ontology of knowledge 390–91, 403
Saarinen, T.F. 391
Sack, R.D. 293
sampling error 82
Santa Barbara Sense-of-Direction Scale (SBSOD) 232, 233, 237
satellite surveys 70
satisficing behavior 45, 63
SBSOD see Santa Barbara Sense-of-Direction Scale (SBSOD)
scene-processing network 159–61
Scruton, R. 340
SDSS see spatial decision support systems (SDSS)
Self-Organising Maps: Applications in GI Science (Agarwal and Skupin) 31
self-organized map (SOM) 31
self-report measures 232–3
of navigation strategy 239–40
and objective measures 236–7
SemaFORR 149
semantic system, of spatial cognition 213
semiotics 181–2
Sendero group 282
sensation 8
sense of direction 124–5
sense of place 300–301
Sense–Plan–Act framework 149
sensory modalities 8
SEU see subjective expected utility (SEU)
sex differences
in geographic cognition 253
in human navigation 252
maze behavior 252
in virtual water maze performance 250
sex steroids 252
Shelton, A.L. 238
Shelton, T. 357
Siegel, A.W. 375
Silenton 235
Silverman, I. 253
Simon, H.A. 44, 45, 62, 63, 392–3
simulated action information 102
SIRN see synergetic inter-representation networks (SIRN)
situational approach method 63
sketch mapping 233
Skinner, B.F. 23
small-scale environments 249
small-scale space
children’s understanding of 374–5
maps and models 377
small-scale spatial abilities 237–9, 252
Smith, B. 216
Smith-Jackson, T.L. 249
Smith, T.R. 359, 360
social amplification of risk framework 327
Social Justice and the City (Harvey) 20
social space 61, 294
socio-cultural factors, gender differences 251–2
socio-cultural theory 381
Soh, B.K. 249
Soja, E.W. 294
SOM see self-organized map (SOM)
Index 417

SOT see spatial orientation test (SOT)

space
  children’s knowledge of 374
definition 373
environmental 373
Euclidean aspects of 375
figural 373
geographic 373, 379
heterogeneity of 142
mathematical and topological models 294
multiplicity of 293
as scarce resources 75
and time 293
vista 373

Space and Place (Tuan) 20

space–time accessibility measures (STAMs) 88
space–time paths 76–7
space–time prism (STP) 77–9, 82–4, 88
  measurement error 83
  reliable 83
  rough 83
Sparks, J. 249
spatial ability 231
spatial behavior 4, 10, 116, 404
decision making and 11
spatial characteristics 41
spatial cognition 198, 200, 232
  blind see blind spatial cognition
  semantic system of 213
  verbalization 213
spatial cognitive engineering 200
spatial consumer behavior 41
spatial decision-making models
  adaptive structuration theory 47–8
  applications of 41, 42
  bounded rationality 44–5
  decision-theoretic concepts in 48–51
  enhanced adaptive structuration theory 48
  experimental research on 52
  prospect theory 45–6
  rational decision-making model 43–4, 46
spatial decision support systems (SDSS) 47, 50
spatial field methods 82
spatial geography 17
spatial hypothesis testing 279
spatial information, combined representations of 108
spatial knowledge 376
  acquisition 124
  cognitive mapping, individual differences 129–33
  internally representing environment 124–5
  knowledge integration, empirical research 125–9
classifications of 144
development of 120
  anchor-point theory 120–21
  ontogenesis and microgenesis 121–2
  spatial microgenesis 122–4
  stage and continuous theories 122
types of 119–20
spatial learning 198–9, 294
  acquisition of cognitive maps 135
  support for wayfinding and 135
spatial memory 104, 183–4
spatial microgenesis 122, 131
  alternative frameworks for 131–2
  continuous framework of 124
spatial modeling approaches, diversity of 41–2
spatial navigation 158, 231
spatial optimization models 49
spatial orientation 18, 19, 116, 135
  spatial orientation test (SOT) 238
spatial properties 5
spatial range methods 82
spatial reference frame 277–8
spatial scale 277–8
spatial science, geography as 16–17
spatial sequential memory 237
spatial thinking
  acquisition of cognitive maps 135–6
  cognitive neuroscience of 165–8
  in spatially enabled society 135–6
spatio-cognitive processes 276
spatio-temporal decision 198
spatiotemporal integration 277
spatiotemporal phenomena, human concepts of 216
speed cells 158
Spelke, E.S. 100, 374
stage theories 122
STAMs see space–time accessibility measures (STAMs)
Stea, D. 25
Steele, F. C. 301
Stephenson, N. 357
stochastic microsimulation 66
STP see space–time prism (STP)
Strabo 16
Strohecker, C. 219
structuralist–Marxist–humanistic (SMH)
  revolution 20–22, 34, 35
structural landmark 145
structuration theory 302
subjective expected utility (SEU), of human behavior 62
sudden onset hazards 322
Sullivan, W.C. 13
survey knowledge 119, 124, 125, 142, 148, 233, 234
route vs. 278–9
sustainability, environmental hazards and 323–4
synergetic inter-representation networks (SIRN) 32–3
synergetics (Haken) 29, 32
Taylor, H.A. 12
Tenbrink, T. 12, 215
Thiel, P. 343
This Idea Must Die: Scientific Thoughts That Are Blocking Progress (Brockman) 390
Thorndyke, P.W. 105
Thrash, T. 12
3D geomapping 249
Thrift, N. 295, 296, 299, 357, 391
Thurstone’s Law 23
time
behavior modeling and 60–61
and place 294–5
as scarce resource 75
and space 293
time-based recording 81
time-geographic density estimation 84
time geography 74
analytical 80–81
information and communication technologies 87
mobility data collection 81–2
network time prisms 84–6
path analytics 82
prism analytics 82–4
types of prisms 86–7
applications of 87–8
access to opportunities 88–9
public health 89–90
time and space as scarce resources 75
time–space geography 64
VBM see voxel-based morphometry (VBM)
Tobler, W. 16
Tolman, E.C. 17, 18, 23, 24–5, 117, 118, 132, 141, 250
Tolman’s cognitive maps in men 24–5
Tomasello, M. 379
topographic maps 101
topological knowledge 237
topological measures 88
Torrens, P.M. 13
total dissociation model 238
traffic analysis zones 57
transcranial magnetic stimulation (TMS) 160–61
Transportation Demand Management program 70
transportation modeling, travel demand and 89
time-based recording and place 294–5
behavioral dynamics 65–6
choice and related models 62–3
computational process models 66–7
definitions and framework 56–60
greenhouse gases 60
scale 61
social space 61
space 67–8
stochastic microsimulation 66
time 60–61
data collection approaches 57, 68–71
microsimulation 60
simulation and 59–60
travel log contents 57
travel demand 64
transportation modeling and 89
Tuan, Y.-F. 20, 291, 294, 295, 300
Turing, A.M. 23, 357, 358, 363
Tversky, A. 45, 325
Tversky, B. 27, 30, 100, 101, 142, 149, 179, 184, 201, 218, 219, 220, 221
2D contour map 249
Ulrich, R.S. 313–14, 350
USA Energy Policy Act (1992) 329
US Department of Labor 135
US legal blindness 261
Uttal, D. 13
VBM see voxel-based morphometry (VBM)
verbalization data 215
maps and diagrams 222
perception and description 222
of spatial cognition 213
VGI see volunteered geographic information (VGI)
Vidal de la Blache, Paul 16
virtual geographic environments 235, 236, 363–4
virtual water maze performance 250, 253
Index 419

virtual worlds 363–4
vista spaces 104, 118, 231, 277, 377
visual attention 183
visual impairment 263–4
   factors 261–2
visual landmark 144–5
visual recoding hypothesis 271
visual variables 181
visual vs. nonvisual information 274–6
visuocentrism, problem of 268–9
volunteered geographic information (VGI) 402
Von Neumann, J. 23
Von Senden, S.M. 266
Von Thunen, J.H. 46
voxel-based morphometry (VBM) 162, 164
Voyer, D. 248
vulnerability 323

Wang, F.J. 216
Wang, R.F. 100
Watson, J.B. 22, 23

wayfinding 347–8
   cognitively inspired tools for 149–50
   landmarks in 144–7, 205
   orientation in 147–8
   strategy 239, 250–51
web analytics 190
Weber, R. 339, 340
Weisberg, S.M. 133
Weston-Smith, M. 390
White, G.F. 322, 323, 391
White, R. 17, 34
Whorf, B. 212
Wineman, J.D. 349
Wohlwill, J.F. 308
Wolpert, J. 46
Woodcock, D.M. 316

Yellow Pages directory 145, 146
Yong, E. 399

Zubin, D. 277
Zumthor, P. 345