

Table of Contents

List of tables	8
List of figures	9
Acknowledgements	15

Foreword: The dawn of a philosophy of visualization	17
<i>Alberto Cairo, Knight Chair at the University of Miami and author of How Charts Lie</i>	

1. Introduction: The relationships between graphs, charts, maps and meanings, feelings, engagements	19
<i>Helen Kennedy and Martin Engebretsen</i>	

Section I Framing data visualization

2. Ways of knowing with data visualizations	35
<i>Jill Walker Rettberg</i>	
3. Inventorizing, situating, transforming: Social semiotics and data visualization	49
<i>Giorgia Aiello</i>	
4. The political significance of data visualization: Four key perspectives	63
<i>Torgeir Uberg Nærland</i>	

Section II Living and working with data visualization

5. Rain on your radar: Engaging with weather data visualizations as part of everyday routines	77
<i>Eef Masson and Karin van Es</i>	
6. Between automation and interpretation: Using data visualization in social media analytics companies	95
<i>Salla-Maaria Laaksonen and Juho Pääkkönen</i>	

7. Accessibility of data visualizations: An overview of European statistics institutes 111
Mikael Snarud and Andrea Velazquez
8. Evaluating data visualization: Broadening the measurements of success 127
Arran L. Ridley and Christopher Birchall
9. Approaching data visualizations as interfaces: An empirical demonstration of how data are imag(in)ed 141
Daniela van Geenen and Maranke Wieringa
10. Visualizing data: A lived experience 157
Jill Simpson
11. Data visualization and transparency in the news 169
Helen Kennedy, Wibke Weber, and Martin Engebretsen

Section III Data visualization, learning, and literacy

12. What is visual-numeric literacy, and how does it work? 189
Elise Seip Tønnessen
13. Data visualization literacy: A feminist starting point 207
Catherine D'Ignazio and Rahul Bhargava
14. Is literacy what we need in an unequal data society? 223
Lulu Pinney
15. Multimodal academic argument in data visualization 239
Arlene Archer and Travis Noakes

Section IV Data visualization semiotics and aesthetics

16. What we talk about when we talk about beautiful data visualizations 259
Sara Brinch

17.	A multimodal perspective on data visualization <i>Tuomo Hiippala</i>	277
18.	Exploring narrativity in data visualization in journalism <i>Wibke Weber</i>	295
19.	The data epic: Visualization practices for narrating life and death at a distance <i>Jonathan Gray</i>	313
20.	What a line can say: Investigating the semiotic potential of the connecting line in data visualizations <i>Verena Elisabeth Lechner</i>	329
21.	Humanizing data through 'data comics': An introduction to graphic medicine and graphic social science <i>Aria Alamalhodaei, Alexandra Alberda, and Anna Feigenbaum</i>	347

Section V Data visualization and inequalities

22.	Visualizing diversity: Data deficiencies and semiotic strategies <i>John P. Wihbey, Sarah J. Jackson, Pedro M. Cruz, and Brooke Foucault Welles</i>	369
23.	What is at stake in data visualization? A feminist critique of the rhetorical power of data visualizations in the media <i>Rosemary Lucy Hill</i>	391
24.	The power of visualization choices: Different images of patterns in space <i>Britta Ricker, Menno-Jan Kraak, and Yuri Engelhardt</i>	407
25.	Making visible politically masked risks: Inspecting unconventional data visualization of the Southeast Asian haze <i>Anna Berti Suman</i>	425
26.	How interactive maps mobilize people in geoactivism <i>Miren Gutiérrez</i>	441
	Index	457

Index

References to data visualizations are abbreviated to DVs throughout the index, except for its own main entry where it is spelled out in full.

References to illustrations and diagrams are in **bold**.

- abortion
 - and DVs 392, 394–403, **395**, 397, **401**
 - representations, body issues 394–403
 - sonograms 399–400
 - in the US 400, **401**, 402
- abortion pill, opinions about 395–6, **395**
- abortion rate, poverty rate, relationship 397–8, **397**, 400
- activism *see* geoactivism
- Andrewes, R.J., *Info We Trust* 17
- aesthetics, DVs 24, 260–1, 316, 322–6, 350
 - see also* beauty; data sublime
- AI (Artificial Intelligence) 41
- Aiello, Giorgia 26
- Alamalhodaie, Aria, Alberda, Alexandra & Feigenbaum, Anna 29
- animation 192, 304, 340, 447
 - and narrativity 303, 305
- anthropometrics, France 38
- APIs (Application Programming Interfaces) 145, 408
- Archer, Arlene & Noakes, Travis 28
- artful revelation, DVs 98
- automated accessibility testing 113–14
- automated checker tools 112–13, 121
 - limitations 113
 - see also* WTKollen checker tool
- average, as the norm 40–1
- aXe Core 121
- Barthes, Roland
 - Mythologies* 54
 - on narrative 42
- beauty
 - and the beautiful 261–4
 - by activating 270–1, 271
 - by being a work of art 271–3, 272
 - by letting complexity keep its complex character 269–70
 - Cairo on 263
 - and DVs 259–64, 266–74
 - examples 265, 267, 268, 271, 272
 - and elegance 263
 - in fine craftsmanship 264, 265, 266
 - Lupi on 262
 - Norman on 263
 - presenting complexity in comprehensible form 266–9, 267, 268
 - problems of explaining 260
 - types 264, 266–73
 - see also* aesthetics
- Beer, David 67
 - on data analytics 96
- bell-shaped curve 40, 41
- Berger, John 164
- Berners-Lee, Tim 115
- Bertillon, Alphonse 38
- Bertin, Jacques 331
- big data
 - characteristics 22
 - ideology of 39
 - limitations 161
- body issues
 - abortion representations 394–403
 - and DVs 392–4
- Brinch, Sara 28
- Buienradar* weather data platform
 - criticism of 77–8, 81
 - in daily routines 88–9
 - default views 78, 79
 - interpretations 86, 87–8
 - interviews with users 81–2
 - origins 80–1
 - popularity 81
 - public understanding of 85–6
 - rain graph 85
 - self-definition 81
 - significance 89–91
 - usage patterns 82, 84
- Cairo, Alberto 56
 - on beauty 263
 - The Truthful Art* 263, 266, 273
- Caldas-Coulthard, C.R. & van Leeuwen, T. 52
- canvasses
 - examples 288–9, 289
 - types 279–80
- cartographic workflow, and feminist approach 412, **413**, 414
- cartography 407–8
 - as advocacy tool 444
 - apparent objectivity 410
 - and climate change 444
 - emotional turn 442–3, 444
 - feminist approaches 408–9, 420
 - examples 410–11
 - and gender inequality 409
 - non-institutional
 - as source of legal accountability 435–6
 - as source of social accountability/human agency 432–5
 - see also* Gender Inequality Index (GII); maps

- causality
 - and correlation binary 41–2
 - downplaying of 42
 - and narrative 42
- Census *see* US Census
- change over time, depiction 305–6
- child mortality 201
- China, great famine 196
- Chun, Wendy 42
- citizenship
 - and DVs 68–70, 72
 - and US Census 379
- Clark, Charlie
 - 'Blade Runner' 268
 - The Colors of Motion* 267
- climate change
 - and cartography 444
 - Funny Weather* (data comic) 357, 358–9
 - UN Framework Convention on Climate Change 71
- climate data, and DVs 71
- cohesion
 - multimodal texts 338
 - composition 338
 - information linking 338
 - and rhythm 340
 - and texts 337–8
- Collins, Patricia Hill 217–8
- competence concept, meaning 231
- complexity, communication, simple-boxing 101–2, 105
- composition 281
- concept, definition 224
- conceptual structures 336–7
- connecting lines
 - cohesion 337
 - components 336
 - connecting elements 339
 - context 337
 - definition 332
 - and frame size 341
 - functions 334–6
 - uses 343
 - visualization 340
- consumption, sociocultural context 135–7
- 'ConvinceMe' tool 214–16
- Cook, G., *The Best American Infographics* 273
- Coopmans, Catelijne 98
- correlation, and causality binary 41–2
- Costelnick, Charles & Hassett, Michael, *Shaping Information* 17
- counter-mapping
 - filling institutional gaps 429–32
 - Indonesia 428
 - Southeast Asian haze 428–9
 - see also* Global Forest Watch Fires Map; Kepo Hutan Map
- crime statistics, and DVs 70
- critical discourse analysis, social semiotics 52
- critical making, and critical thinking 158–9
- data
 - definition 21
 - gathering 19–20
 - highlighting, flatter-boxing 102–3
 - qualitative 21
 - quantitative 21
 - structured 21–2
 - systematized 38–9
 - unstructured 22
- see also* big data; datafication
- data analytics
 - Beer on 96
 - see also* social media analytics
- data comics
 - accessibility 348
 - Funny Weather* (climate change) 357–60, 358–9
 - lessons from 360–2
 - reliability 348
 - see also* graphic medicine; graphic social sciences
 - Data Culture Project 215, 227
- data epics 316–17, 326
- examples 314–15, 317–22, 318–21
- sources 325
- data formats, reusable 115–16
- data infrastructure literacy 227
- data interfaces 151
 - definition 142–3
 - and network graphs 150, 152–3, 153
- data intermediaries 96
- Data Journalism Awards 301
- data literacy 211, 227
 - definition 209, 214
 - as set of social practices 209
- data society 224–5
- data subjectivities 162–3, 166
- data sublime features 316, 322
- data transparency, and news professionals 176–82
- data visualizations (DVs)
 - and abortion 392, 394–403, 395, 397, 401
 - aesthetics 24, 260–1, 316
 - as anti-sublime 263
 - artful revelation 98
 - and beauty 259–64, 266–74
 - examples 265–8, 271–2
 - and body issues 392–4
 - books on 17
 - circulation 163–4
 - and citizenship 68–70, 72
 - and climate data 71
 - connecting lines 329–32, 331
 - conventions 55
 - and crime statistics 70
 - and democracy 25, 69
 - design studio
 - empirical evidence 130–1
 - evaluative practices 133–5
 - and disabled persons 115

- and discourse 22, 25–6
 - double role 142
 - and emotions 24, 45, 162–3, 217
 - engagement with 24–5
 - and epistemology 23–4
 - and ethnographic studies 57
 - evaluation practices 128–9, 131–3
 - examples 309–10
 - feminist critique 208, 210, 216–20, 392
 - and frame size 341
 - hedging 243, 245–6
 - examples 244–5
 - humanizing 347–9
 - see also* data comics
 - and ideology 66–7, 72
 - and immigration (US) 372–3, 372–3, 379–86, 381–2, 384
 - and inequality 225
 - as interfaces 142–3, 153
 - interpretation 333–4
 - in journalism 296
 - in journalism course 246–53, 247, 250
 - key questions 20–1
 - manual test procedure 114–6
 - measurement 132
 - media presentations 279
 - multimodal analyses 52, 278–9, 290
 - narrativity in 297, 301, 302, 304, 306–7
 - in news 169–70
 - news professionals' perception 174–6
 - in newsrooms 57
 - and NSIs 112
 - and numerical thinking 67
 - and objectivity 39–40, 172, 175, 278, 392
 - and OCD 158
 - origins 19, 38
 - personal experiences 158, 166–7
 - and perspective 341, 342, 343
 - persuasive powers 98–9
 - as phantasmagrams 44
 - political significance 64, 71
 - as political-administrative steering
 - tool 70–1
 - practitioners 129–30
 - predictive use 44
 - and proxies 42–3
 - and public deliberation 64–6, 71
 - and public opinion formation 65
 - purpose 22, 96, 131
 - scope 19
 - semiotic resources 54–6, 59–60
 - contexts 56–7
 - transforming 57–9
 - skills required for 225–6
 - slideshow format 303, 304
 - social media analytics 96, 100, 104–5
 - data and method 99–100
 - research question 99
 - social relations in 243–4
 - social semiotic approach to argument
 - in 240–2
 - storytelling in 299–301, 303–7
 - as 'super-genre' 49–50
 - and technology 20
 - transparency in 172–3
 - uncertainty 172–3
 - uses 127–8
 - and weather forecasting 70
 - and writing 243
- data visualizations learning
 - case studies 210–16
 - 'ConvinceMe' tool 214–16, 217–18
 - Groundwork Somerville data mural 210–12, 211–12, 217–18
 - Pluralism 219
 - WTFcsv tool 212, 213, 214
- DataBasic web tool 227
- Datafication 20, 98, 315
- Davis, Lennard 40
- Dear Data* project 159, 160, 162
 - Phone Addiction/A Week of Phone Addiction 272
- D'Efilippo, Valentina, *Poppy Field* 162, 271
- democracy, deliberative model 64–5
- design, and elegance 262
- design principle, pluralism 218–19
- diagrams 50, 52
 - clustering 96
 - and 'diagrammatic mode' 55
 - network 104, 209, 306, 331
 - research on 55
 - strategic 58, 242
 - tree 337
 - usefulness 174
- Digicom project, NSIs 123
- digital literacy 229–30
- D'Ignazio, Catherine & Bhargharva, Rahul 28
- D'Ignazio, Catherine & Klein, Lauren 52
 - Data Feminism* 17
- disabled persons, and DVs 115
- discourse
 - definition 25, 242
 - and DVs 22, 25–6
 - technologization of 58
- discourse analysis, and grammar 278
- Doel, M., *Poststructuralist Geographies* 441
- Drucker, Johanna, *Graphesis* 17
- earth, surface temperature explanation 361
- EDA (Exploratory Data Analysis) 143–4, 151
 - and SNA 144
- elegance
 - and beauty 263
 - and design 262
- EMA (Epistemic, Methodological, Aesthetic)
 - framework 349–50, 361–2
 - see also* data comics
- emotional responses, to maps 444–5, 445
- emotional turn, cartography 442–3, 444

- emotions, and DVs 24, 45, 162–3, 217
- Engelbrechtsen, M. & Weber, W. 52
- Engelbart, Douglas 150
- ergodic work
- and exploration 281
 - and interactive DVs 281–2, 287
 - see also* composition
- Eurostat 121, 123
- Evans, Kate
- Funny Weather* (climate change) 357, 358–9, 361
 - aesthetics 360
 - epistemology 357–8
 - methodology 358–9
- Excel 242
- expertise concept 232–3
- Fairclough, N. 58
- Federer, Roger, narrative DV of career 302, 303
- feminism, and pluralism 218
- feminist approaches, cartography 408–11, 420
- feminist critique, of DVs 208, 210, 216–20, 392
- flatter-boxing, data highlighting 102–3, 105
- Forster, E.M., on narrative 42
- frame size
- and connecting lines 341
 - and DVs 341
- France
- anthropometrics 38
 - crime reporting system (1825) 38
- Fraser, Nancy, weak and strong publics 65
- Freire, Paolo 227
- Frow, Emma 98–9
- Gapminder* tool 192, 195, 203
- screenshot 193
- GDPR (General Data Protection Regulation) 121
- Geenen, Daniela van & Wieringa, Maranke 27
- gender inequality, and cartography 409
- Gender Inequality Index (GII) 408
- bar graph with high to low inequality 414, 415
 - colour significance 416, 417
 - geographic distribution of inequality 414, 415
 - map projections, influence 419
 - table with country index value 414, 415
 - unpaid labour variable 416
 - variables included in index 415
 - see also* cartography
- geoactivist maps 443–4, 452
- categorisation 451–2
 - ‘left-to-die boat’ map 445, 446–8, 451–2
 - The 15M animated map 441–2, 442, 450–2
 - ‘West Africa missing fish’ map 448–50, 449, 451–2
- Gephi software
- fieldnotes plug-in 152
- layout algorithms 145, 146–8, 147
 - sociality focus 145–6
 - Visual Network Analysis 143
- GIS (Geographic Information System) 410
- Global Forest Watch Fires Map 430–1, 431
- Google Fusion tables 325
- Google Public Data* 192
- screenshot 193
- grammar
- and discourse analysis 278
 - of DV design 56
 - Reading Images: The Grammar of Visual Design* 333
 - graphic medicine 347, 350–2
 - see also* Taking Turns
- Graphic Social Science Research Network 356
- graphic social sciences 347, 356–60
- Gray, Jonathan 28
- Greenpeace International 429
- Greenpeace Southeast Asia 429
- Groundwork Somerville data mural 210–12, 211–12
- Gulf Stream, explanation 359
- Halliday, M.A.K., functions in verbal language 333
- Halliday, M.A.K. & Hasan, R., *Cohesion in English* 337
- Halloran, Neil
- The Fallen of World War II* 314, 318–19, 319
 - data sublime features (table) 322
 - scale and individual features (table) 323
 - sounds 317
 - visual strategies 317
 - The Shadow Peace: The Nuclear Threat* 314, 319–21, 320–1
 - data sublime features (table) 322
 - scale and individual features (table) 323
 - sounds 320
- Halpern, O.
- Beautiful Data* 17
 - on visualization 101, 105
- hand drawing, visualization 164–6
- Harraway, Donna 208
- Hasan, Ruqaiya 191
- healthcare, machine learning in 43
- Hiippala, Tuomo 28
- Hispanics, in US Census 376
- hooks, bell 209
- identities 369–70
- and immigration (US) 379–84, 381–2, 384
 - and US Census 375–6, 378–9
- ideology
- and DVs 66–7, 72
 - and US Census 375
- images, text alternatives 115

- immigration (US)
 and diversity 371
 DVs 372–3, 372–3, 379–86, 381–2, 384
 and identities 379–84, 381–2, 384
- Impakt Festival 152–3
- Indonesia
 Centre for Environmental Law 429
 counter-mapping 428–9
 Friends of the Earth Indonesia 429
 One Map initiative 429
- inequality
 and DVs 225
 and literacy 229–30
- information graphics 55
 rhino populations 283, 284
- Information is Beautiful Awards 301, 314
- Ingold, Tim, on lines 336
- interfaces
 definition 142
 DVs as 142–3, 153
 as mediators 142–3
- IPCC (Intergovernmental Panel on Climate Change) 71
- Isotope Institute 315
- isotypes 315, 317
- journalism
 DVs in 296
 storytelling in 295–7
- journalism course, DVs in 246–53, 247, 250
- Kandinsky, Wassily 331
- Kant, Immanuel, on the sublime 45
- Kennedy, Helen 39, 52, 57
 & Hill, R. 69, 162
 Weber, Wibke & and Engebretsen, Martin 27
- Kepo Hutan Map 430, 432
- Kirk, Andy 52, 56
Data Visualisation 262, 266, 273
- know-how concept 232
- knowledge production, context 216–17
- Kvasny, Lynette 209
- Laaksonen, Salla-Maaria & Pääkkönen, Juho 27
- Latour, Bruno, *Science in Action* 141
- Law of the Sea, Convention 447
- layout, and page-flow 289
- learning
 and literacy 194
 as self-transformation 193–4
- Lechner, Verena 28–9
- Ledin, P. & Machin, D. 52, 55, 58, 242, 278, 288
- Leeuwen, Theo van 54, 58, 59
- Leeuwen, Theo van & Kress, Gunther, *Reading Images: The Grammar of Visual Design* 333
- lines 331–2
- Ingold on 336
see also connecting lines
- literacy
 action literacy 191, 203
 alternatives to 230–3
 concept 224–8, 233
 definition 224
 dimensions 228
 gender, and racial literacy 220
 and inequality 229–30
 and learning 194
 as metaphor 229
 and power 230
 racial, and gender literacy 220
 recognition literacy 191, 203
 reflection literacy 191, 203–4
 social change enabler 227–8
 as social practice 226–7
see also data literacy; digital literacy;
 literacy practices; orality and literacy;
 visual-numeric literacy
- literacy practices
 analysis 194
 and literary events 190
 misreadings 200, 201, 202
 successful 194–6
 weak 196, 197, 198–9
- Longinus, on the sublime 45
- Lupi, Giorgia 347
 on beauty 262
- machine learning, in healthcare 43
- Mackenzie, Donald, *Inventing Accuracy* 39–40
- Manovich, Lev 263–4
- map making *see* cartography
- mapping
 humanitarian emergencies,
 Ushahidi 446
see also counter-mapping
- maps
 and data sources 451–2
 emotional responses to 444–5, 445
 styles 451
see also geoactivist maps
- Masson, Eef & Es, Karin van 27
- Mayer-Schönberger, Viktor & Cukier, Kenneth,
Big Data 42
- media
 canvases, types 279–80
 presentations, DVs 279
- mental illness, visualization 159–61, 161
- methane gas, explanation 358
- Minard, Charles Joseph, map of Napoleon's
 Russian campaign, 1812–13 265, 266, 305
- multimodal analyses 277
 DVs 52, 278–9, 290
 examples 282–90
 need for exhaustivity 287–8
- Murphy, Michelle, *The Economization of Life* 40

- Nærland, Torgeir 27
- narrative
- Barthes on 42
 - and causality 42
 - Forster on 42
 - story, distinction 297–8
- narrative structures 336–7
- narrativity
- and animation 303, 305
 - components and conditions (table) 299
 - in DVs 297, 301, 302, 304, 306–7
- narrator, and real author 301, 303
- National Digital Learning Arena, Norway 192
- Native Americans
- map 375
 - and US Census (1790) 375–6
- network graphs
- and data interfaces 150, 152–3
 - Twittersphere (Dutch) 148–50, 149
- network visualization
- cultural circulation 151
 - life of 144–50
- Neurath, Marie & Otto 315
- New London Group 190
- New Writing 58, 242
- news
- DVs in 169–70
 - transparency in 170–2
- news professionals
- and data transparency 176–82
 - DVs, perception of 174–6
 - Interviews 173–4
- newsrooms, DVs in 57
- norm, average as 40–1
- Norman, Donald A.
- on beauty 263
 - Emotional Design* 263
- Norway, National Digital Learning Arena 192
- NSIs (National Statistics Institutes) 27
- country list 117
 - data presentation analysis 118
 - Digicom project 123
 - DV accessibility 120–2
 - and DVs 112
 - findability 117–18
- exhibitory DVs 120
- explanatory DVs 119
 - feedback mechanisms 122
 - good practices 123
 - interactive visualization analysis 118–19
 - user support 120
 - web accessibility 116–17
 - WTKollen checker tool 112, 117
- numbers, trust in 39
- numerical thinking, and DVs 67
- objectivity
- apparent, cartography 410
 - and DVs 39–40, 172, 175, 392
- OCD (Obsessive Compulsive Disorder)
- and DVs 158
 - illustration 161
- On Broadway*, visualization project 269–70
- Ong, Walter, on orality and literacy 37
- open data initiatives 411
- orality and literacy
- distinction 37
 - Ong on 37
- organization
- spatial and visual 37
 - and visualization 36
- OSM (OpenStreetMap) 410–11
- Pearson, Karl 315
- perspective, and DVs 341, 342, 343
- phantasmagrams, DVs as 44
- Pickles, John 17
- Pinker, Steven 314, 325
- Pinney, Lulu 28
- plastic pollution, DVs 286–7, 288
- pluralism
- design principle 218–19
 - in DVs learning 219
 - and feminism 218
- political significance, DVs 64, 71
- Posavec, Stefanie, *Writing Without Words* 270
- power, and literacy 230
- PowerPoint 55, 242
- prenatal care, medicalization of 39
- pretty-boxing, data 103–5
- public deliberation, and DVs 64–6, 71
- public opinion formation, and DVs 65
- quantification 315
- types of 38
- Quetelet, Adolphe 40, 42–3
- Rendgen, Sandra & Wiedemann, Julius, *History of Information Graphics* 17
- Rettberg, Jill Walker 26
- rhythm, and cohesion 340
- Ridley, Arran & Birchall, Christopher 27
- Roth, Wolff-Michael, *Toward and Anthropology of Graphing* 17
- semiotic regimes 53
- semiotic resources
- DVs 54–6, 59–60
 - see also social semiotics
- sequentiality 304–5
- showing, vs telling 296–7, 307
- comparison (table) 298
 - Martini Glass structure 300, 300
- signs, functions 240
- simple-boxing, communication of complexity 101–2, 105
- Simpson, Jill 27
- Site Morse 121

- skill concept 231–2
- slave trade (African), to the Americas, historical rendering 374, 374
- slaves, and US Census (1790) 376
- SNA (Social Network Analysis) and EDA 144
- Snarud, Mikael & Velazquez, Andrea 27
- social change, and literacy as enabler 227–8
- social media analytics
- in business-to-business context 97
 - credibility in 100–1
 - DVs 96, 100, 104–5
 - as research context 97
- social practice, literacy as 226–7
- social semiotic approach to argument, in DVs 240–2
- social semiotics, aims 54
- social semiotics
- aim 56
 - critical aims 53
 - critical discourse analysis 52
 - and DVs 23, 52
 - functionalism 53
 - origins 53
 - and semiotic innovation 50–1
- sociality focus, Gephi software 145–6
- sonification 303–4
- Southeast Asian haze
- and access to environmental information 428
 - causes 427
 - counter-mapping 428–9
 - DVs 425–6
 - empirical research 427
 - health risks 427
 - see also* Indonesia
- Staley, David J., *Computers, Visualization, and History* 17
- Statistics Norway 120, 121
- STEM (Science, Technology, Engineering and Medicine) 207
- Sterne, Jonathan 37
- story, narrative, distinction 297–8
- storytelling 295
- data-driven 301
 - in DVs 99–301, 303–7
 - in journalism 295–7
 - see also* tellability
- the sublime
- Kant on 45
 - Longinus on 45
 - as rhetorical technique 45
- Taking Turns*
- account of AIDS crisis 352, 353–6
 - aesthetics 354–5
 - epistemology 352
 - methodology 352–3
- technology, and DVs 20
- tellability 306
- temperature anomalies (1900–2016) 284–6, 285
- term, definition 224
- texts
- and cohesion 337–8
 - multimodal, cohesion 338
- timelines 305
- Tønnessen, Elise Seip 28
- Transboundary Haze Pollution Act (THPA, 2014) 436
- Tufte, Edward 51
- Tufte, Edward R.
- Beautiful Evidence* 264
 - The Visual Display of Quantitative Information* 263
- Tversky, Barbara 36–8
- Twittersphere (Dutch), network graphs 148–50, 149
- uncertainty, DVs 172–3
- United Nations
- Convention on Rights of Persons with Disabilities 111
 - Framework Convention on Climate Change 71
 - Sustainable Development Goals (SDGs) 408
- US Census
- and citizenship 379
 - exclusions from 375–9
 - Hispanics 376
 - and identities 375–6, 378–9
 - and ideology 375
- US Census (1790)
- and Native Americans 375–6
 - and slaves 376
- US Census (1870), categories 377
- US Census (1890), categories 377
- US Census (1940), categories 377
- Ushahidi, mapping humanitarian emergencies 446
- VGI (Volunteered Geographic Information) 411
- Visual Network Analysis, Gephi software 143
- visual-numeric literacy 190–1, 208, 227
- case study 192–204
 - numeric dimension 191
 - visual modes 191
- visualization
- connecting lines 340
 - Halpern on 101, 105
 - hand drawing 164–6
 - and organization 36
 - philosophy 17–18
 - see also* data visualizations (DVs); network visualization
- visualization project, *On Broadway* 269–70

- Wachter-Boettcher, Sara, *Technically Wrong* 40–1
- WAD (European Web Accessibility Directive) 111–13, 120, 123–4
- WCAG (Web Content Accessibility Guidelines) 113
- weather forecasting
and DVs 70
see also buinradar weather forecasting platform; temperature anomalies
- weather report, newspaper 83
- Weber, Wibke 28
- Wind Map 267
- Winner, Langdon, *The Whale and the Reactor* 17
- Wong, Wucius 332
- WRI (World Resources Institute) 429
- writing
and DVs 243
see also New Writing
- WTFcsv tool 212, 213, 214
- WTKollen checker tool, and NSIs 112, 117, 121