

Index

- accessibility
 - colourblindness, 105
 - general resources, 106
 - physicalization, 104
 - practical suggestions, 107, 108
 - sonification, 102
- aesthetic considerations
 - colour, 84
 - colour palettes, 86
 - colour schemes, 85
 - decluttering, 89
 - layout, 89
 - sizing, 89
- AI-aided charts, 202
- algae blooms, 34, 252–256, 258, 259
- alluvial diagrams, 197
- analytical design, 7
 - comparison, 9
 - content first and foremost, 18
 - documentation, 16
 - integration of evidence, 14
 - mechanism, structure, explanation, 10
 - multivariate analysis, 13
- animated charts, 193
- area charts, 191
- attentive processes, 82
- bar charts and variants, 38, 185
 - R, 213–216, 226–229
- boxplots, 41
 - R, 219
- bubble charts, 43, 189
 - R, 230–234
- chart type
 - alluvial diagrams, 197
 - animated charts, 193
 - area charts, 191
 - bar charts and variants, 185
 - bubble charts, 189
 - charts to avoid, 198
 - Chernoff faces, 197
 - choice, 47
 - choropleths, 188
 - heat maps, 188
 - histograms, 180
 - interactive charts, 193
 - line graphs, 184
 - maps, 188
 - network diagrams, 193
 - parallel coordinates, 193
 - radar charts, 193
 - rug plots, 180
 - Sankey diagrams, 197
 - scatterplots, 179
 - small multiples, 189
 - tables, 184
 - text blocks, 183
 - text charts, 191
 - tree diagrams, 193
 - treemaps, 191
 - two-way tables, 182
- charts to avoid, 198
- chatbot, 202
 - ChatGPT, 202–209
 - GPT-4, 209, 210
 - WolframAlpha, 209, 210
- ChatGPT, 202–209
- Chernoff faces, 197
- choropleth maps, 44
- choropleths, 188
- closure principle, 74
- colour, 84
 - palettes, 86
 - scheme, 85
 - wheels, 84
- colour palettes, 86
 - Carter and Carter's 26 colours, 88
 - Kelly's maximum contrast, 87
 - Tol's rainbow, 87
 - ZHM's 24 colours, 86
- colour wheels, 85
- colourblindness, 105
- command line tools, 201
- common fate principle, 74
- comparison, 9
- content first and foremost, 18
- continuation principle, 69
- dashboards, 24
 - audiences, 170
 - design principles, 25
 - exploration, 168
 - form, 25
 - functionality, 25
 - Golden Rules, 28
 - layout, 25
 - narrative, 173
 - horizontal logic, 173
 - vertical logic, 173
 - presentation requirements, 171
 - putting it all together
 - guidelines, 173
 - situational awareness, 168
 - storyboarding, 171, 172
 - storybooks, 169
 - structural integrity, 25
 - target audience, 24
 - workflow, 24
- data analysis, 31
 - workflow, 32
- data communication, 31
 - basic rules, 48
- data exploration, 31
 - algae blooms, 34
- data layering, 21
- data physicalization, 104
 - data mapping, 104
 - tactile variables, 104
- data presentation, 31
- data representation, 101
 - exploration, 102
 - storytelling, 102
- data sonification, 102
 - data mapping, 103
- data stories, 119, 121, 149, 154–156
 - active, 158
 - ambiguity, 150
 - clarity, 150
 - dashboard planning, 152
 - dashboards, 167
 - exploration, 168
 - situational awareness, 168
 - storybooks, 169
 - data, 121
 - EPL Redcards (Same Data, Different Stories), 122
 - evolving a chart, 160–162

- explanation, 156
- exploration, 156
- falsification, 157
- Flattening the Curve, 115, 116
- goals, 128
- illustrations, 149
- narrative, 121
- persuasion, 156
- potential, 158
- red cards (Same Data, Different Stories), 121
- scoping, 156
- tropes, 137, 162
 - broken axes, 165
 - cluster bar charts, 163
 - colour coding, 164
 - gauge, pie, donut charts, 164
 - intersections, 163
 - trend lines, 162
- visual, 121, 149
- visual choices, 151
 - flow, 152
 - frame, 151
 - image, 152
 - moment, 151
 - word, 152
- Visual Cinnamon, 122, 123
- words and images, 150
- data storytelling, 102
- data visualization, 6, 7, 31
 - alluvial diagrams, 197
 - animated charts, 193
 - area charts, 191
 - bar charts and variants, 38, 185
 - basic rules, 48
 - boxplots, 41
 - bubble charts, 189
 - charts to avoid, 198
 - Chernoff faces, 197
 - choropleths, 188
 - comparison, 177
 - composition, 177
 - distribution, 177
 - heat maps, 188
 - histograms, 38, 180
 - interactive charts, 193
 - line charts, 39
 - line graphs, 184
 - maps, 188
 - network diagrams, 193
 - parallel coordinates, 193
 - radar charts, 193
 - relationship, 177
 - rug plots, 38, 180
 - Sankey diagrams, 197
 - scatterplots, 39, 179
 - small multiples, 189
 - tables, 184
 - text blocks, 183
 - text charts, 191
 - tree diagrams, 193
 - treemaps, 191
 - two-way tables, 182
 - workhorses, 38
- decluttering, 89, 90
 - guidelines, 90
- description, 3
- documentation, 16
- evolving a story chart, 160
 - numbers and tables, 160
 - pretty charts, 162
 - simple charts, 161
 - story charts, 162
 - ugly charts, 160
- explanation, 3
- exploration, 3
- exploration dashboards, 168
- extelligence, 132
- falsification, 157
- figure/ground duality principle, 73
- focal point principle, 71
- focused hierarchies, 83
- fragmented perception, 63
- fundamental principles of
 - analytical design, 7
 - comparison, 9
 - content first and foremost, 18
 - documentation, 16
 - integration of evidence, 14
 - mechanism, structure, explanation, 10
 - multivariate analysis, 13
- future tools, 202
 - AI-aided charts, 202
 - chatbot, 202
 - ChatGPT, 202–209
 - GPT-4, 209, 210
 - virtual reality, 202
 - WolframAlpha, 209, 210
- Gestalt principles, 68
 - closure, 74
 - combinations, 75
 - common fate, 74
 - continuation, 69
 - figure/ground duality, 73
 - focal point, 71
 - guidelines, 76
 - isomorphic correspondence, 72
 - proximity, 70
 - similarity, 71
 - simplicity, 69
 - uniform connectedness, 75
- ggplot2, 235
 - aesthetics, 236, 242, 243
 - area charts, 289
 - bar charts and variants, 273–276, 282–286, 288, 292
 - boxplots, 255, 256, 258, 259, 307
 - bubble charts, 261
 - calendar heatmaps, 291
 - categorical scatterplots, 280, 281
 - clusters, 301
 - correlograms, 293
 - dendrograms, 306
 - density curves, 254, 255, 272, 273
 - density plots, 306
 - dotplots, 307
 - dumbbell charts, 302
 - examples
 - algae blooms, 252–256, 258, 259
 - Conjugal Status Chart, 263
 - Diagram of the Causes of Mortality in the Army in the East, 262, 263
 - Health and Wealth of Nations, 260, 261
 - Map of the London Cholera Outbreak, 267
 - Minard's March to Moscow, 265, 266
 - US census PUMS data, 268–286
 - facets, 244, 245, 259, 285, 286
 - funnel charts, 290
 - geometries, 236, 238–241
 - grammar, 235
 - heat maps, 279

- histograms, 254, 255, 270–272
- jitter charts, 287
- maps, 267
- marginal distributions, 288
- multiple graphs, 245, 246
- parallel coordinates, 295
- radar charts, 262, 263
- saving graphs, 251
- scatterplots, 259, 277, 278, 287
- slope charts, 304
- small multiples, 244, 245
- smoothing lines, 286
- themes, 246, 247
- tidy data, 247–251
- time series and variants, 296
- treemaps, 294
- violin plots, 258
- waffle charts, 308
- GPT-4, 209, 210
- grammar of graphics, 92
 - ggplot2, 235, 236, 238–251
 - layers
 - aesthetics, 92
 - coordinates, 92
 - data, 92
 - facets, 92
 - geometry, 92
 - statistics, 92
 - themes, 92
 - semantics, 92
 - syntax, 92
- GUI tools, 199
- guidelines, 48
- Health and Wealth of Nations, 260, 261
 - comparison, 9
 - content first and foremost, 19
 - documentation, 16
 - grammar of graphics, 93, 95–100
 - integration of evidence, 15
 - mechanism, structure, explanation, 11
 - multivariate analysis, 14
- heat maps, 188
- histograms, 38, 180
 - R, 216–218, 226–229
- historical visualizations, 3
- Diagram of the Causes of Mortality in the Army in the East, 4, 262, 263
- Map of the London Cholera Outbreak, 267
- Map of the London Cholera Outbreak of 1854, 5
- Minard’s March to Moscow, 4, 20, 265, 266
- Tableau Poléométrique, 5
- The Commercial and Political Atlas, 5
- The Exhibit of American Negroes at the 1900 Paris World Exposition, 5
- iconic memory, 67, 72, 81
 - attentive processes, 82
 - pre-attentive processes, 81
- infographic, 6, 7
- integration of evidence, 14
- interactive charts, 193
- isomorphic correspondence
 - principle, 72
- layout, 89
- line charts, 39
- line graphs, 184
 - R, 218, 219
- long-term memory, 81, 84
- maps, 188
- mechanism, structure, explanation, 10
- meme, 118, 145
- memory
 - focused hierarchies, 83
 - iconic, 67, 72, 81
 - long-term, 81, 84
 - short-term, 81, 83
- Minard’s March to Moscow, 20
 - data layering, 21
 - visual hierarchy, 22
- misleading charts
 - what to watch for, 52
- MS Excel, 200
- multivariate analysis, 13
- multivariate observations, 42
 - bubble charts, 43
 - choropleths, 44
 - network diagrams, 44
 - parallel coordinates, 46
- narrative structures, 137, 138
- story spine, 138
- network diagrams, 44, 193
- Occam’s Razor, 13
- parallel coordinates, 46, 193
- persuasion, 3
- physicalization, 104
 - data mapping, 104
 - tactile variables, 104
- Power BI, 200, 309–337, 339–342, 344, 345
 - appending tables, 342, 344, 345
 - calculated columns, 316–325
 - calculated measures, 316–325
 - calculated tables, 316–325
 - cleaning, 341
 - components of default view, 309
 - custom sorting, 335–337
 - filtering, 326–328
 - groups, 331–335
 - hierarchies, 329–331
 - importing data, 312–314
 - logical operations, 325, 326
 - mathematical operations, 325, 326
 - modeling data, 312, 314–316
 - removing rows, 337, 339
 - replacing values, 339, 340
 - slicing, 326–328
 - splitting columns, 340
 - trimming, 341
- pre-attentive processes, 66, 81
- presentation requirements, 171
- proximity principle, 70
- Python, 201
- R, 201
 - bar charts and variants, 213–216, 226–229
 - boxplots, 219
 - bubble charts, 230–234
 - ggplot2, 235
 - histograms, 216–218, 226–229, 253
 - line graphs, 218, 219
 - scatterplots, 211–213, 220–226, 256
- radar charts, 193
- retinal variables, 48
- rug plots, 38, 180

- SaaS apps, 200
- Sankey diagrams, 197
- scatterplots, 39, 179
 - R, 211–213, 220–226
- short-term memory, 81, 83
 - focused hierarchies, 83
- similarity principle, 71
- simplicity principle, 69
- situational awareness dashboards, 168
- sizing, 89
- small multiples, 189
- sonification, 102
 - data mapping, 103
- stories, 114, 115
 - adjacent narrative, 118, 119
 - Cassiopeia, 112
 - cultural stories, 127
 - data stories, 119, 121, 128, 149
 - data, 121
 - narrative, 121
 - visual, 121, 149
 - domains of human
 - endeavours, 116, 117
 - Flattening the Curve, 115, 116
 - ideal, 119
 - jokes, 118
 - lies-to-children, 116, 126
 - literacy, 133
 - logic, 119
 - logical space, 117
 - memetic power, 118
 - plot, 117
 - bare story, 118
 - purpose, 112
 - risks, 123
 - best voice, 125, 126
 - choices, 123
 - misleading, 124
 - survivorship bias, 124, 125
 - roles and functions, 127
 - scientific stories, 128
 - sequential space, 117
 - trappings, 118
- storyboarding, 171, 172
- storybooks, 167, 169
- storytelling
 - audiences, 128
 - beginnings and endings, 141
 - content, 139
 - context, 129, 132
 - data stories, 128
 - data tropes, 137
 - dissemination, 142
 - foundation, 140
 - goals, 127
 - how not to tell a story, 148
 - material, 140, 141
 - molecules, 134
 - narrative structures, 137, 138
 - risks, 123
 - best voice, 125, 126
 - choices, 123
 - misleading, 124
 - survivorship bias, 124, 125
 - sharing, 142
 - story spine, 138
 - tropes, 133–135, 137
 - universality, 129, 132
 - visual choices, 151
 - flow, 152
 - frame, 151
 - image, 152
 - moment, 151
 - word, 152
- storytelling with data, 102
- Tableau, 200
- tables, 184
- target audience, 24
- text blocks, 183
- text charts, 191
- tree diagrams, 193
- treemaps, 191
- two-way tables, 182
- uniform connectedness principle, 75
- virtual reality, 202
- vision science, 63
 - attentive processes, 82
 - fragmented perception, 63
- Gestalt principles, 68
 - pre-attentive attributes, 66, 81
- visual hierarchy, 22
- visual storytelling choices, 151
 - flow, 152
 - frame, 151
 - image, 152
 - moment, 151
 - text and chart combinations, 153
 - word, 152
- visualization goals
 - description, 3
 - explanation, 3
 - exploration, 3
 - persuasion, 3
- visualization software, 199
 - command line tools, 201
 - Python, 201
 - R, 201
 - future tools, 202
 - AI-aided charts, 202
 - virtual reality, 202
- GUI tools, 199
 - MS Excel, 200
 - Power BI, 200
 - SaaS apps, 200
 - Tableau, 200
- visualizations
 - bar charts and variants, 38
 - boxplots, 41
 - histograms, 38
 - historical, 3
 - line charts, 39
 - rug plots, 38
 - scatterplots, 39
 - workhorses, 38
- WolframAlpha, 209, 210
- words and images, 150
- workflow, 24, 32
- workhorse visualizations, 38
 - bar charts and variants, 38
 - boxplots, 41
 - histograms, 38
 - line charts, 39
 - rug plots, 38
 - scatterplots, 39

References

Here are the references in citation order.

- [1] Patrick Boily and Jen Schellinck. *Data Understanding, Data Analysis, and Data Science (Course Notes)* [↗](#). Data Action Lab, 2022 (cited on pages vii, 34, 41, 42, 104, 117, 119, 125, 129, 194, 211, 235, 248, 257, 259, 312, 315).
- [2] E. Tufte. *The Visual Display of Quantitative Information*. Graphics Press, 2001 (cited on pages 3, 21, 26, 57, 90).
- [3] E. Tufte. *Beautiful Evidence*. Graphics Press, 2008 (cited on pages 3, 7–11, 13–16, 18, 21, 26, 185, 189, 207).
- [4] C. Nussbaumer Knaflic. *Storytelling with Data*. Wiley, 2015 (cited on pages 3, 26, 64, 76, 94, 151, 152, 160, 166, 174).
- [5] W. Battle-Baptiste and B. Rusert. *W.E.B. Du Bois's Data Portraits: Visualizing Black America*. Princeton Architectural Press, 2018 (cited on pages 3, 263).
- [6] Stephanie Evergreen. *Effective Data Visualization: the Right Chart for the Right Data*. Second edition. Thousand Oaks, California: SAGE Publications, Inc (cited on page 3).
- [7] A. Cairo. *The Functional Art*. New Riders, 2013 (cited on pages 3, 26, 27).
- [8] A. Cairo. *The Truthful Art*. New Riders, 2016 (cited on pages 3, 27).
- [9] I. Meirelles. *Design for Information : an Introduction to the Histories, Theories, and Best Practices Behind Effective Information Visualizations*. Rockport, 2013 (cited on pages 3, 26, 66, 76).
- [10] N. Yau. *Visualize This: The FlowingData Guide to Design, Visualization, and Statistics*. Wiley, 2011 (cited on page 3).
- [11] S. Wexler, J. Shaffer, and A. Cotgreave. *The Big Book of Dashboards*. Wiley, 2017 (cited on pages 3, 24, 29, 200).
- [12] M. Friendly and H. Wainer. *A History of Data Visualization and Graphic Communication*. Harvard University Press, 2021 (cited on page 3).
- [13] Sandra Rendgen. *The Minard System : the complete statistical graphics of Charles-Joseph Minard, from the collection of the École Nationale des Ponts et Chaussées*. Princeton Architectural Press, 2018 (cited on pages 3, 20, 21, 207).
- [14] Juuso Koponen and Jonatan Hildén. *Data Visualization Handbook*. English. 1. Finland: Aalto University, 2019 (cited on page 3).
- [15] C. Ware. *Information Visualization: Perception for Design*. Elsevier Science, 2020 (cited on page 3).
- [16] N. Bremer and S. Wu. *Data Sketches: A journey of imagination, exploration, and beautiful data visualizations*. AK Peters Visualization Series. CRC Press, 2021 (cited on page 3).
- [17] Robert A. Dahl. 'Cause and Effect in the Study of Politics'. In: *Cause and Effect*. Ed. by Daniel Lerner. New York: Free Press, 1965, pp. 75–98 (cited on page 10).
- [18] A.B. Hill. 'The environment and disease: association or causation?' In: *Proc R Soc Med* 58.5 (1965), pp. 295–300 (cited on page 13).
- [19] *Map of Europe in 1812* [↗](#). World History Commons (cited on page 20).
- [20] T. Lentz. *Le Premier Empire: 1804 - 1815*. Grand Pluriel. Fayard/Pluriel, 2018 (cited on page 20).
- [21] Data Action Lab Podcast. *Episode 3 - Minard's March to Moscow* [↗](#). 2020 (cited on page 21).

- [22] Z. Gemignani and C. Gemignani. *Data Fluency: Empowering Your Organization with Effective Data Communication*. Wiley, 2014 (cited on page 24).
- [23] Z. Gemignani and C. Gemignani. *A Guide to Creating Dashboards People Love to Use* . (ebook) (cited on page 24).
- [24] Matillion.com. 'Poor Use of Dashboard Software' . In: () (cited on page 28).
- [25] Geckoboard.com. 'Two Terrible Dashboard Examples' . In: () (cited on page 28).
- [26] Alex Knapp. 'How Much Does It Cost To Find A Higgs Boson?' . In: *Forbes* (July 2012). [Online; accessed 11-Jan-2021] (cited on page 31).
- [27] @DamianMingle. '<https://twitter.com/DamianMingle/status/655534652833288192>' . In: *Twitter.com* (Oct. 2015) (cited on page 31).
- [28] Leadership and Success. *Leadership Journey: Richard Feynman* . [Online; accessed 12-Jan-2021] (cited on page 31).
- [29] Dheeru Dua and Casey Graff. *UCI Machine Learning Repository* . 2017 (cited on page 34).
- [30] Jens Strackeljan. *COIL Competition Dataset* . 1999 (cited on page 34).
- [31] Luis Torgo. *Data Mining with R, 2nd ed.* CRC Press, 2016 (cited on pages 34, 252).
- [32] Anders Boeck Jensen et al. 'Temporal disease trajectories condensed from population-wide registry data covering 6.2 million patients'. English. In: *Nature Communications* 5 (2014). doi: [10.1038/ncomms5022](https://doi.org/10.1038/ncomms5022) (cited on pages 38, 194).
- [33] Janessa M. Graves et al. 'Public Bicycle Share Programs and Head Injuries'. In: *American Journal of Public Health* 104.8 (2014), e106–e111 (cited on page 40).
- [34] T. Elms. *Lexical Distance of European Languages* . Etymologikon, 2008 (cited on page 45).
- [35] J. Bertin. *Semiology of Graphics: Diagrams, Networks, Maps*. UMI Research Press, 1983 (cited on page 48).
- [36] A.L. Yarbus. *Eye Movements and Vision*. Plenum Press, New York, 1967 (cited on page 63).
- [37] Information Design Foundation. *Gestalt Principles* . [Online; accessed 16-Oct-2020] (cited on page 68).
- [38] Steve Connor. 'Why some shapes are more pleasing to the eye than others' . In: *The Independent* (Dec. 2009) (cited on pages 69, 186).
- [39] Daydreaming Numbers. *Gestalt Laws Applied to Data Visualization* (cited on pages 75, 76).
- [40] Nate Cohn. 'Poll Shows Tight Race for Control of Congress as Class Divide Widens' . In: *The New York Times* (July 2022) (cited on page 77).
- [41] Kate Newton and Felipe Rodrigues. 'Labour Day: a vote-by-vote analysis of New Zealand's historic shift to the political left' . In: *Stuff* (Oct. 2020) (cited on page 77).
- [42] Oxfam Ireland. *A year in review* (cited on page 78).
- [43] Lena V. Groeger. 'A Big Article About Wee Things' . In: *ProPublica* (Sept. 2014) (cited on page 82).
- [44] I. Meireilles. *Design for Information*. Rockport, 2013 (cited on page 83).
- [45] N. Cowan. 'The magical number 4 in short-term memory: a reconsideration of mental storage capacity' . In: *Behav Brain Sci* (2001), pp. 87–114 (cited on page 83).
- [46] Gobet F. and Clarkson G. 'Chunks in expert memory: evidence for the magical number four ... or is it two?' . In: *Memory* (2004), pp. 732–747 (cited on page 83).
- [47] Scott McCloud. *Making Comics: Storytelling Secrets of Comics, Manga and Graphic Novels*. Harper, 2006 (cited on pages 84, 127, 149–151).
- [48] Scott McCloud. *Understanding Comics: The Invisible Art*. Harper, 1994 (cited on pages 84, 154).

- [49] Achim Zeileis, Kurt Hornik, and Paul Murrell. 'Escaping RGBland: Selecting colors for statistical graphics [↗](#)'. In: *Computational Statistics & Data Analysis* 53.9 (2009), pp. 3259–3270 (cited on pages 86, 87).
- [50] Paul Tol. 'Colour schemes [↗](#)'. In: *SRON Technical Note* 09-002.3.2 (2021) (cited on page 87).
- [51] Kenneth L. Kelly. '22 Colours of Maximum Contrast'. In: *Color Eng.* 6 (1965) (cited on page 87).
- [52] Robert C. Carter and Ellen C. Carter. 'High-contrast sets of colors'. In: *Applied Optics* 21.16 (Aug. 1982), pp. 2936–2939 (cited on page 88).
- [53] N. Duarte. *Resonate: Present Visual Stories that Transform Audiences*. Wiley, 2013 (cited on page 90).
- [54] Leland Wilkinson. *The Grammar of Graphics*. Statistics and Computing. Springer, 1999 (cited on pages 92, 201, 234, 235).
- [55] H. Wickham. 'A Layered Grammar of Graphics'. In: *Journal of Computational and Graphical Statistics* 19 (2009), pp. 3–28 (cited on pages 92, 234, 235).
- [56] Dipanjan Sarkar. 'A Comprehensive Guide to the Grammar of Graphics for Effective Visualization of Multi-dimensional Data [↗](#)'. In: *Towards Data Science* (Sept. 2018) (cited on page 92).
- [57] R. A. Fisher. 'The Use of Multiple Measurements in Taxonomic Problems'. In: *Annals of Eugenics* 7.7 (1936), pp. 179–188 (cited on page 94).
- [58] Abdul Majed Raja. 'Penguins Dataset Overview - iris alternative [↗](#)'. In: *Towards Data Science* (June 2020) (cited on page 94).
- [59] Robert W. Massof. 'The Role of Braille in the Literacy of Blind and Visually Impaired Children'. In: *Archives of Ophthalmology* 127.11 (Nov. 2009), pp. 1530–1531 (cited on page 101).
- [60] 'Is The Hunt For The 'God Particle' Finally Over? [↗](#)'. In: *Morning Edition, NPR* (July 2012) (cited on page 103).
- [61] M. Ascher and R. Ascher. *Mathematics of the Incas: Code of the Quipu*. Dover Publications, 2013 (cited on page 104).
- [62] Paul Beynon-Davies. 'Significant threads: The nature of data'. In: *International Journal of Information Management* 29.3 (2009), pp. 170–188 (cited on page 104).
- [63] Tom Poppe and Frederick Otto. *Tactile Graphics Starter Kit*. American Printing House for the Blind, 1994 (cited on page 104).
- [64] *Color Blindness* [↗](#). National Eye Institute (cited on page 105).
- [65] Nick Babich. 'Accessibility for Visual Design [↗](#)'. In: *UX Booth* (June 2017) (cited on page 105).
- [66] Masataka Okabe and Kei Ito. 'Color Universal Design (CUD): How to make figures and presentations that are friendly to Colorblind people [↗](#)'. In: *J*FLY* (Nov. 2002) (cited on page 105).
- [67] Allie Ofisher. 'Inclusive Color Palettes for the Web [↗](#)'. In: *Medium* (May 2018) (cited on page 105).
- [68] Lyndsey Pereira-Brereton and Luisa Bider. 'Three ways to make your charts more accessible: how to increase impact and engagement by designing for everyone [↗](#)'. In: *Flourish* (Mar. 2021) (cited on pages 107, 108, 154).
- [69] *Constellation guide: Cassiopeia* [↗](#) (cited on page 112).
- [70] Nadiéh Bremer. *Figures in the Sky: How cultures across the World have seen their myths and legends in the stars* [↗](#) (cited on pages 112–114, 123, 131, 169).
- [71] I. Stewart, J. Cohen, and T. Pratchett. *The Science Of Discworld*. Ebury Publishing, 2002 (cited on pages 113, 116, 141).
- [72] I. Stewart, J. Cohen, and T. Pratchett. *The Science Of Discworld II: The Globe*. Ebury Publishing, 2009 (cited on pages 114, 117, 126, 139).

- [73] M. W. Travis. *What Is a Story, and Where Does It Come From?* [↗](#). 2011 (cited on page 114).
- [74] Richard Dawkins. New York: Oxford University Press, 1976 (cited on page 115).
- [75] Paul Gil. 'What is a Meme?' [↗](#). In: *Lifewire* (Dec. 2021) (cited on page 115).
- [76] Osbert Lancaster. *Sign of the Times, 1939-1961*. John Murray, London (cited on page 115).
- [77] Caroline Hopkins. 'Covid-19 patients are flooding New York hospitals, and the peak may be 3 weeks away' [↗](#). In: *Vox* (Mar. 2020) (cited on page 116).
- [78] Dylan Scott. 'Lockdowns worked. Now what?' [↗](#). In: *Vox* (May 2020) (cited on page 116).
- [79] Dylan Scott. 'Flattening the curve worked — until it didn't' [↗](#). In: *Vox* (Dec. 2020) (cited on page 116).
- [80] Peter Dodds. *Of (im)possible interest* [↗](#) (cited on pages 116, 119, 120).
- [81] Information is Beautiful. *How Do We Get To Zero Greenhouse Gas Emissions?* [↗](#). 2019 (cited on pages 119, 120).
- [82] Catherine Cote. 'Data Storytelling: How to Effectively Tell a Story with Data' [↗](#). In: *Harvard Business School Online's Business Insights Blog* (Nov. 2021) (cited on page 121).
- [83] Christie Aschwanden and Ritchie King. 'Science isn't broken - It's just a hell of a lot harder than we give it credit for' [↗](#). In: *FiveThirtyEight.com* (Aug. 2015) (cited on page 121).
- [84] R. Silberzahn et al. 'Many Analysts, One Data Set: Making Transparent How Variations in Analytic Choices Affect Results' [↗](#). In: *Advances in Methods and Practices in Psychological Science* 1.3 (2018), pp. 337–356 (cited on pages 121, 122).
- [85] Saskya Vandoorne. 'France kept classrooms open 'at all costs.' At a school where 20 pupils lost loved ones, some say the price was too high' [↗](#). In: *CNN* (May 2021) (cited on page 124).
- [86] 'The Toxic Ten: How ten fringe publishers fuel 69% of digital climate change denial' [↗](#). In: *Center for Countering Digital Hate* (Nov. 2021) (cited on page 124).
- [87] C. Douglas Golden. 'CNN Debunks Its Own Misleading Headline in the Same Story'. In: *The Western Journal* (May 2021) (cited on page 124).
- [88] Jesse Beckett. 'Statistician Abraham Wald's counterintuitive insight saved lives' [↗](#). In: *War History Online* (July 2021) (cited on pages 124, 125).
- [89] P.E. Tetlock and D. Gardner. *Superforecasting: The Art and Science of Prediction*. Random House Business, 2016 (cited on page 125).
- [90] R. Fulford. *The Triumph of Narrative: Storytelling in the Age of Mass Culture*. The CBC Massey Lectures. House of Anansi Press Incorporated, 1999 (cited on page 126).
- [91] Philip Ball. 'The Story Trap' [↗](#). In: *Aeon* (Nov. 2015) (cited on page 127).
- [92] H. Mittelmark and S. Newman. *How Not to Write a Novel: 200 Classic Mistakes and How to Avoid Them – a Misstep-by-Misstep Guide*. HarperCollins, 2009 (cited on page 128).
- [93] Jefferson Graham. 'Behind the FTC/YouTube influencer scandal' [↗](#). In: *USA Today* (July 2016) (cited on page 128).
- [94] This Day in History. 'The Payola scandal heats up' [↗](#). In: *History.com* (Nov. 2009) (cited on page 128).
- [95] Sam Keaser. 'Actually, It's Not About Ethics in Video Game Journalism: Reconsidering Gamergate' [↗](#). In: *The Amherst Student* (Jan. 2015) (cited on page 128).
- [96] Roland Barthes. 'La mort de l'auteur'. In: *Le Bruissement de la langue. Essais critiques IV* (1968), pp. 63–69 (cited on page 130).
- [97] I. Stewart and J. Cohen. *Fragments of Reality: The Evolution of the Curious Mind*. Cambridge University Press, 1997 (cited on page 132).

- [98] [totropes.com](#) (cited on page 133).
- [99] N. Gabler. *Life: The Movie*. Vintage. Knopf Doubleday Publishing Group, 2011 (cited on page 133).
- [100] Reedsy Blog. *Story Structure: 7 Narrative Structures All Writers Should Know* (cited on page 138).
- [101] Emma Coates. *Pixar's 22 Rules of Storytelling*. Aerogramme Writer's Studio (cited on page 138).
- [102] Meg Bowles et al. *How to Tell a Story*. Crown, 2022 (cited on page 139).
- [103] 'The Soviet Story by Anecdote and Humour'. In: *World History* (Mar. 2018) (cited on page 140).
- [104] Yash Gupta. 'Dashboards and Data Story-telling Explained!'. In: *Medium* (Oct. 2020) (cited on page 144).
- [105] Zach Weinersmith and Ross Nover. *The top 6 reasons this infographic is just wrong enough to sound convincing* (cited on page 147).
- [106] H. Rosling. *The Health and Wealth of Nations*. Gapminder Foundation, 2012 (cited on pages 151, 174).
- [107] D. Hoftstadter. *Gödel, Escher, Bach: an Eternal Golden Braid*. Basic Books, 1979 (cited on page 152).
- [108] Phoebe Tickell. 'COVID-19: The Story of the Impossible Train'. In: *Medium* (Nov. 2020) (cited on page 153).
- [109] K.R. Popper. *The Logic of Scientific Discovery*. University Press, 1959 (cited on page 157).
- [110] S. A. McLeod. 'Karl Popper: theory of falsification'. In: *Simply Psychology* (May 2020) (cited on page 157).
- [111] W. Van Orman Quine. *Two Dogmas of Empiricism*. Philosophical review. Longmans, Green, 1951 (cited on page 157).
- [112] T.S. Kuhn. *The Structure of Scientific Revolutions*. Phoenix Books. University of Chicago Press, 1969 (cited on page 157).
- [113] Cole Nussbaumer Knaflic. *Storytelling with Data: Let's Practice!* Wiley, 2019 (cited on page 160).
- [114] Clayton High School. 'Crossing the Line: Student Sexual Harassment & Assault'. In: *CHS Globe* (Dec. 2011) (cited on page 163).
- [115] Andy Kriebel. *What characteristics are most important to British men and women?* (cited on page 164).
- [116] J. Dougherty and I. Ilyankou. *Hands-On Data Visualization*. O'Reilly, 2021 (cited on page 164).
- [117] E. Ricks. 'Declutter! (and question default settings)'. In: *Storytelling With Data Blog* (May 2019) (cited on page 166).
- [118] R. Sleeper. *Practical Tableau: 100 Tips, Tutorials, and Strategies from a Tableau Zen Master*. O'Reilly, 2018 (cited on page 200).
- [119] W. Chang. *R Graphics Cookbook: Practical Recipes for Visualizing Data*. O'Reilly, 2018 (cited on page 201).
- [120] H. Wickham. *ggplot2: Elegant Graphics for Data Analysis (2nd ed)*. Springer, 2016 (cited on page 201).
- [121] Kyran Dale. *Data Visualization with Python and JavaScript: Scrape, Clean, Explore, and Transform Your Data*. O'Reilly, 2016 (cited on page 201).
- [122] W.S. Cleveland. *Visualizing Data*. AT&T Bell Laboratories, 1993 (cited on page 235).
- [123] H. Wickham, D. Navarro, and T. Lin Pedersen. *ggplot2: Elegant Graphics for Data Analysis*. Springer, 2021 (cited on pages 235, 252).
- [124] K. Healey. *Data Visualization: A Practical Introduction*. 2018 (cited on pages 236, 252).
- [125] H. Wickham. 'Tidy Data'. In: *Journal of Statistical Software* 59.10 (2014) (cited on page 247).
- [126] W. Chang. *R Graphics Cookbook*. O'Reilly, 2013 (cited on page 252).
- [127] V.B. Lanzetta. *R Data Visualization Recipes*. Packt Publishing, 2017 (cited on page 267).
- [128] N. Zumel and J. Mount. *Practical Data Science with R, Second Edition*. Manning, 2019 (cited on page 268).
- [129] Microsoft. *Use DAX in Power BI Desktop* (cited on page 316).
- [130] Wikipedia. 'Data wrangling'. In: (2023) (cited on page 337).