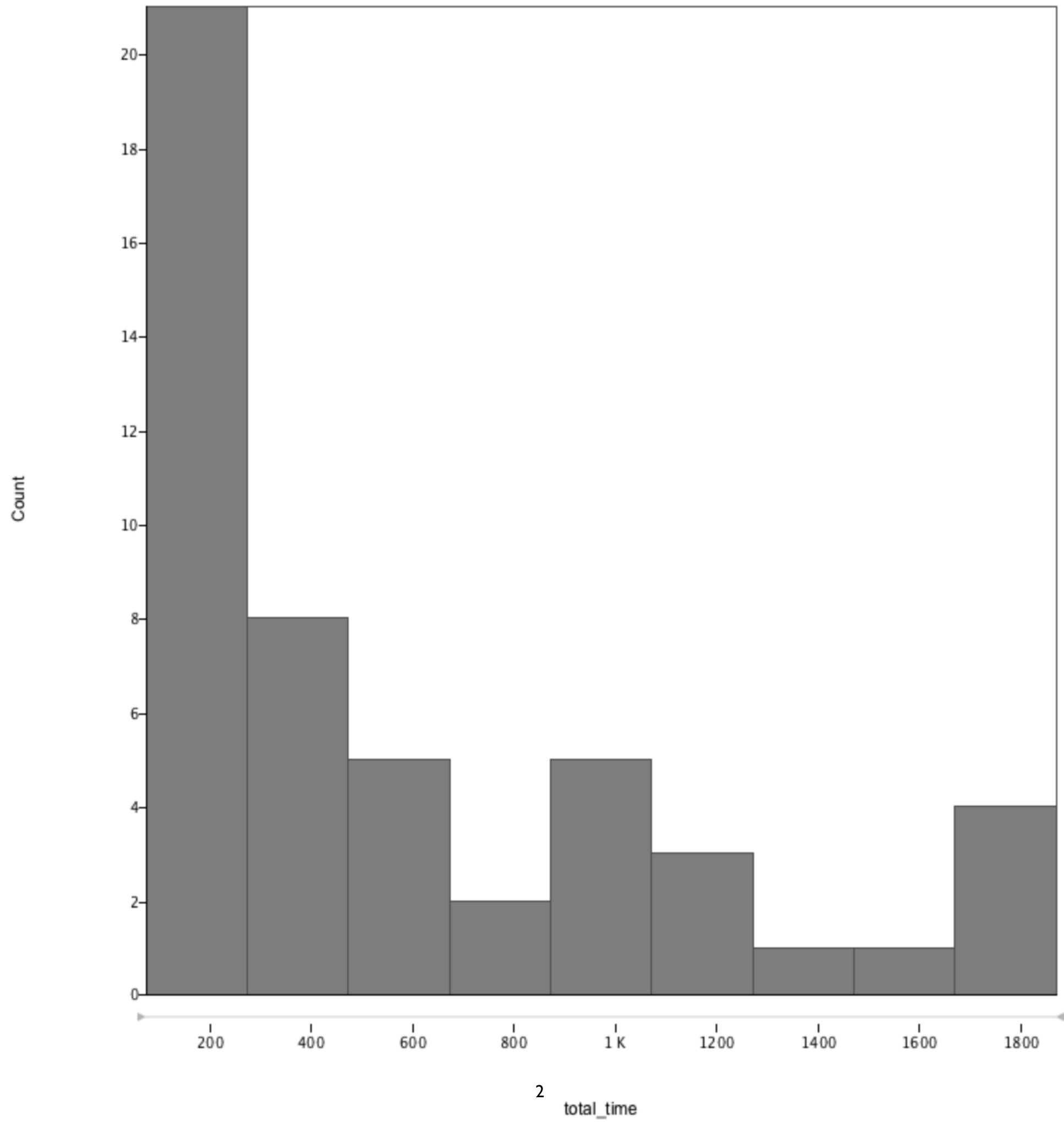


Chapter 3:

Marks and Channels



Line

Rectangle

color

y-position

Text

x-position

total_time

Width

Height

unit

20
18
16
14
12
10
8
6
4
2
0

200

400

1200

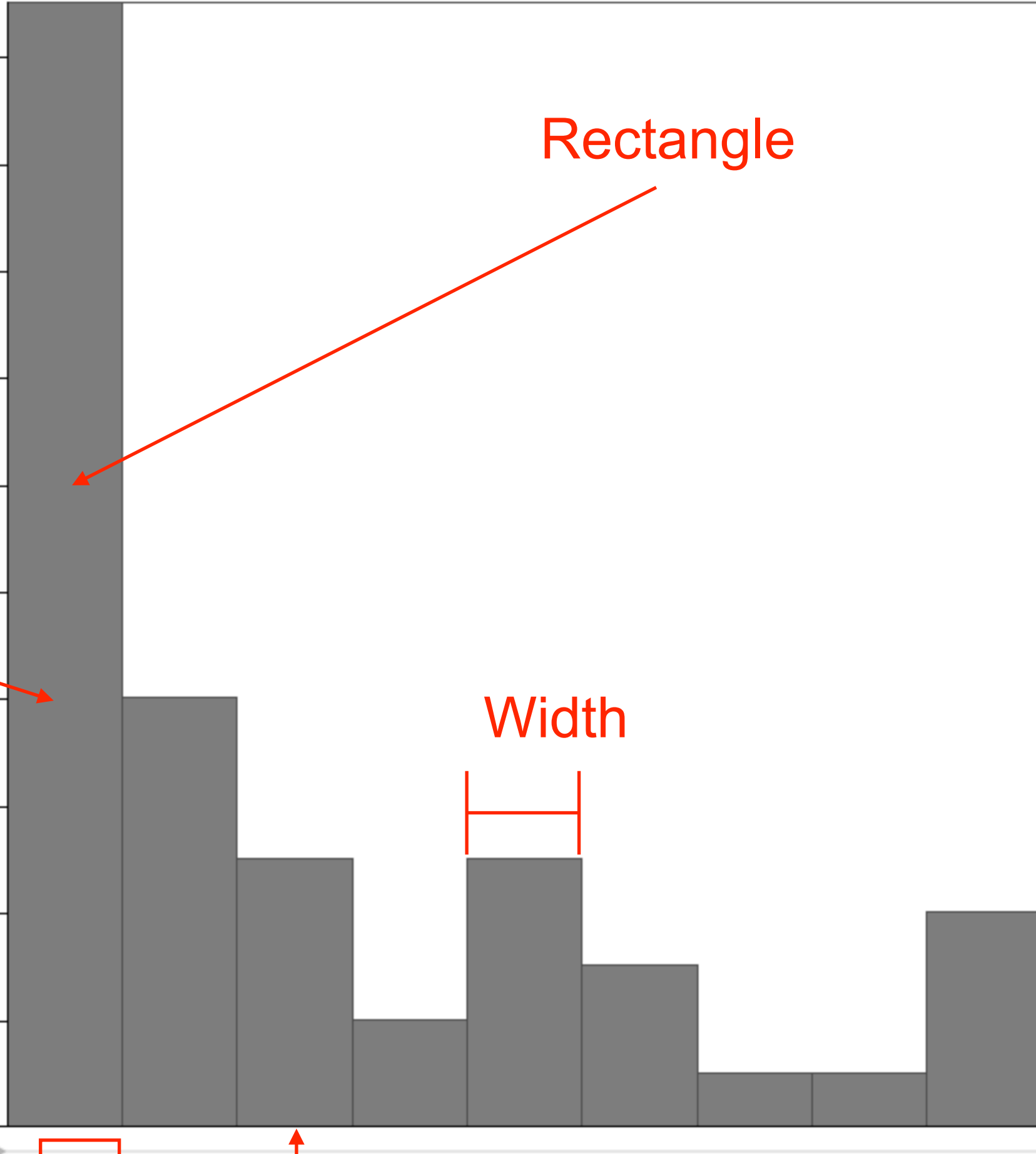
1400

1600

1800



3



- **Mark:** basic graphical element / geometric primitive:

- point (0D)

➔ **Points**

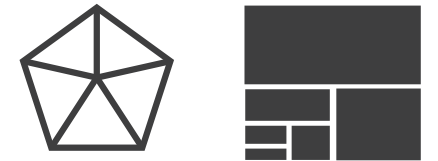
- line (1D)

➔ **Lines**

- area (2D)

➔ **Areas**

- volume (3D)



- **Channel:** control appearance (of a mark)

- position

➔ **Position**

➔ Horizontal

➔ Vertical

➔ Both



- size

➔ **Color**



- shape

➔ **Shape**



➔ **Tilt**



- orientation

- hue, saturation, lightness

➔ **Size**

➔ Length






➔ Area

➔ Volume



- etc.

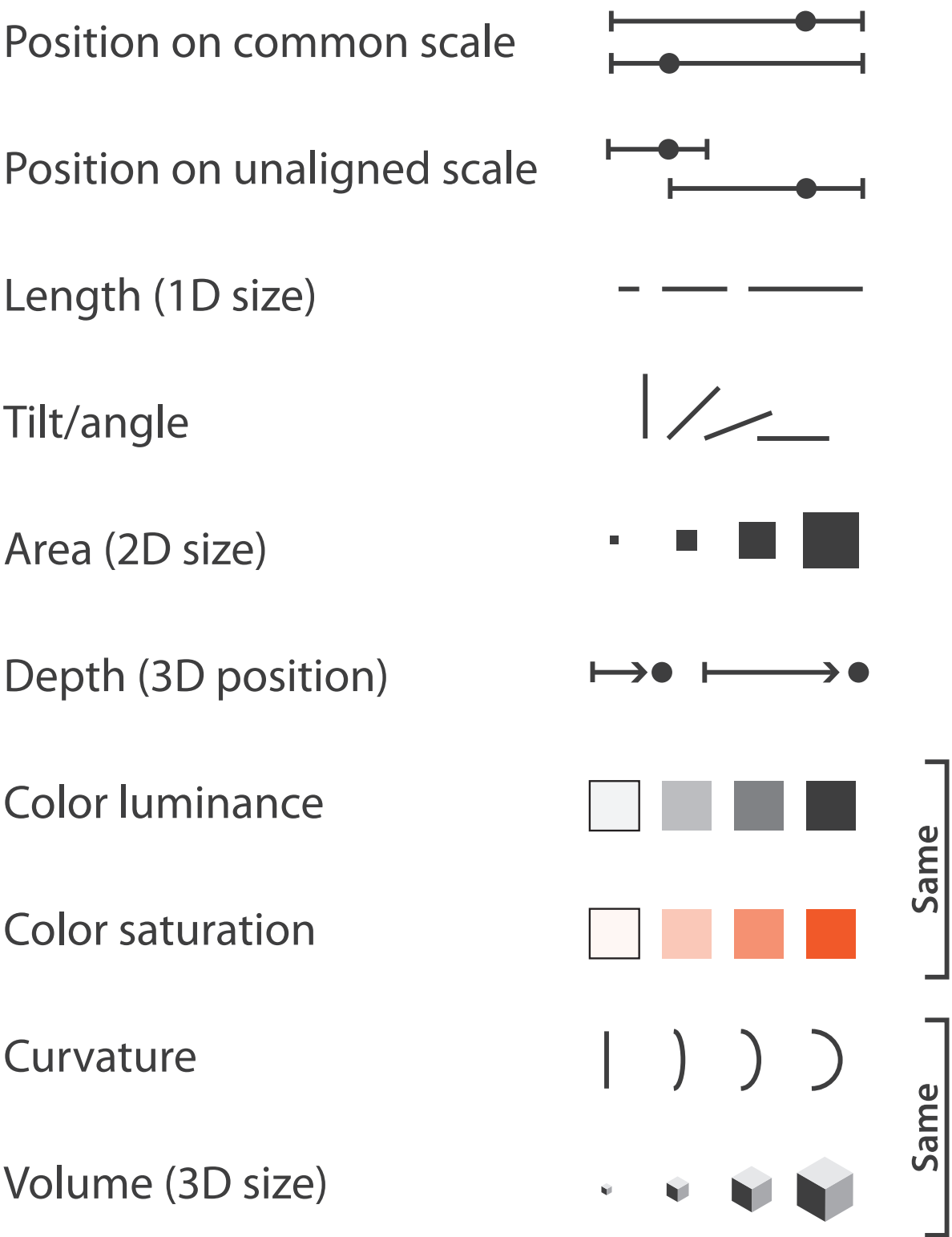
Marks and Channels in Polaris

property	marks	ordinal/nominal mapping	quantitative mapping
shape	glyph	○ □ + △ S U	
size	rectangle, circle, glyph, text		
orientation	rectangle, line, text	— / \ \ /	
color	rectangle, circle, line, glyph, y-bar, x-bar, text, gantt bar		

“Polaris: A System for Query, Analysis and Visualization of Multi-dimensional Relational Databases”, Chris Stolte and Pat Hanrahan

Channels: Expressiveness Types and Effectiveness Ranks

➔ **Magnitude** Channels: **Ordered** Attributes

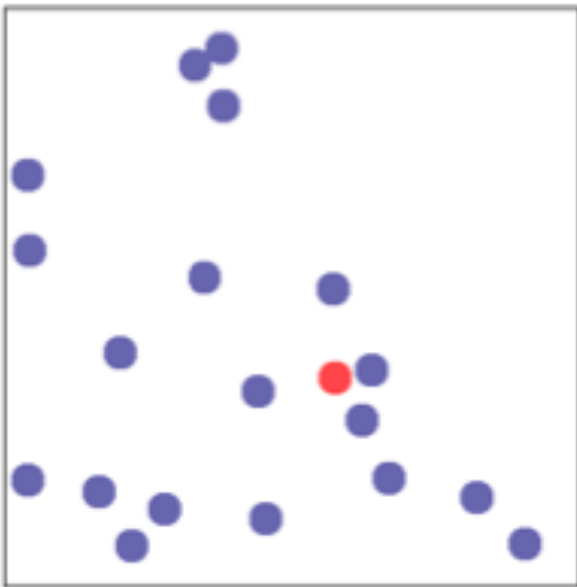


➔ **Identity** Channels: **Categorical** Attributes



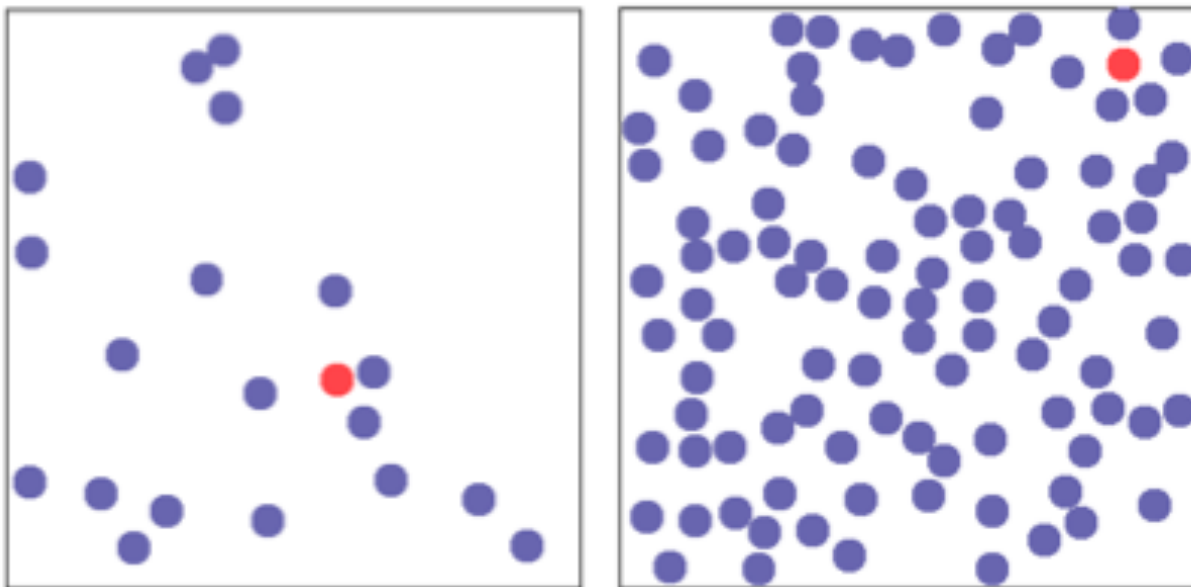
Popout - Preattentive processing

- parallel (visual processing)



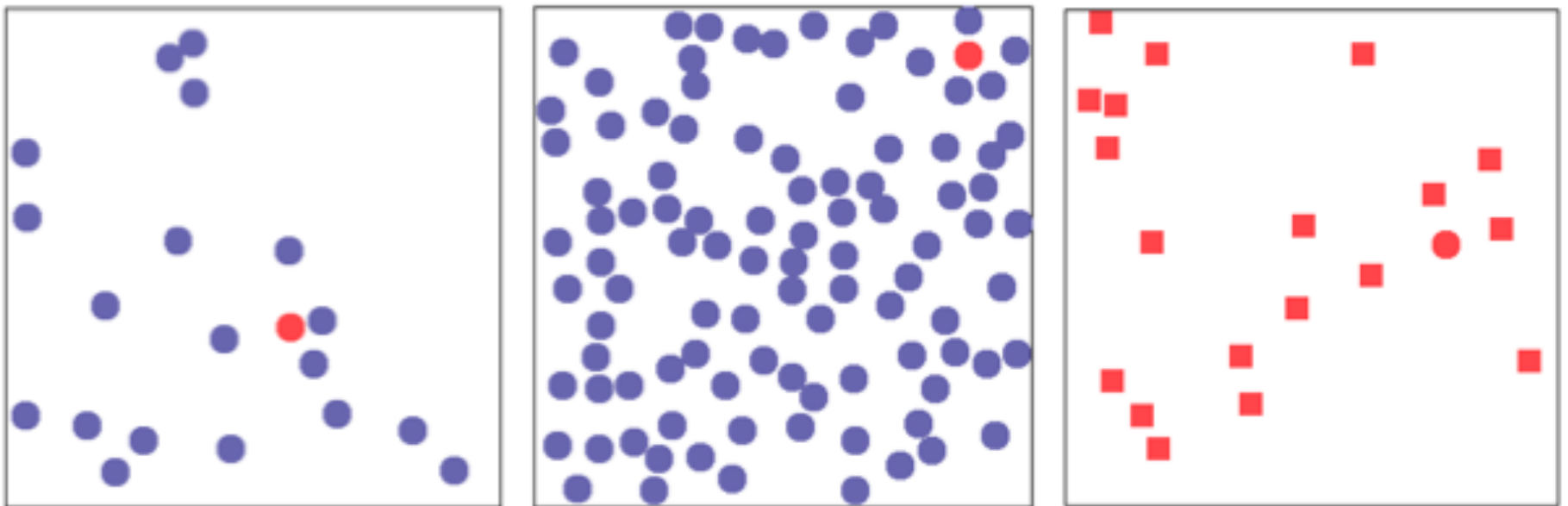
Popout - Preattentive processing

- parallel (visual processing)



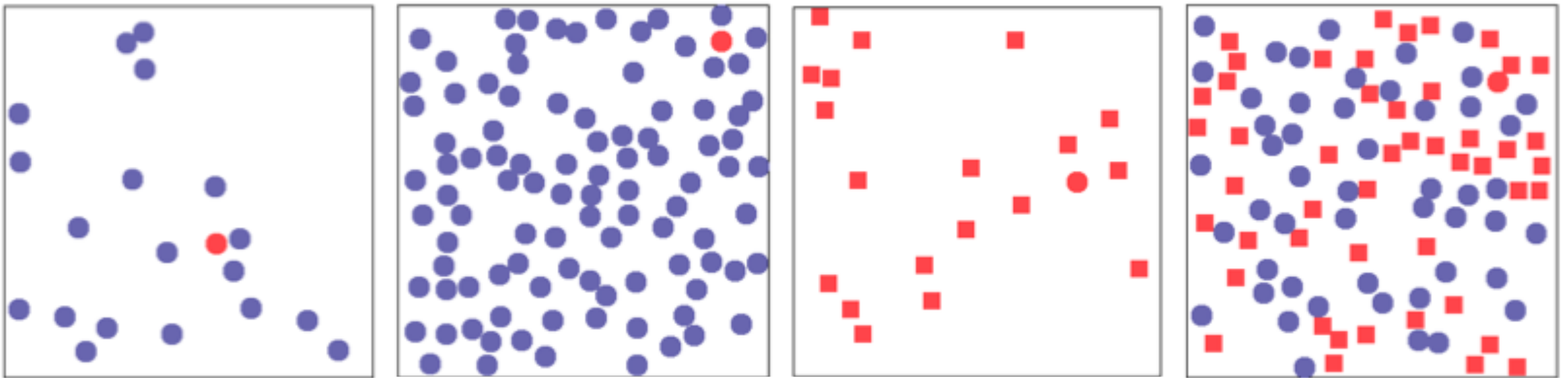
Popout - Preattentive processing

- parallel (visual processing)

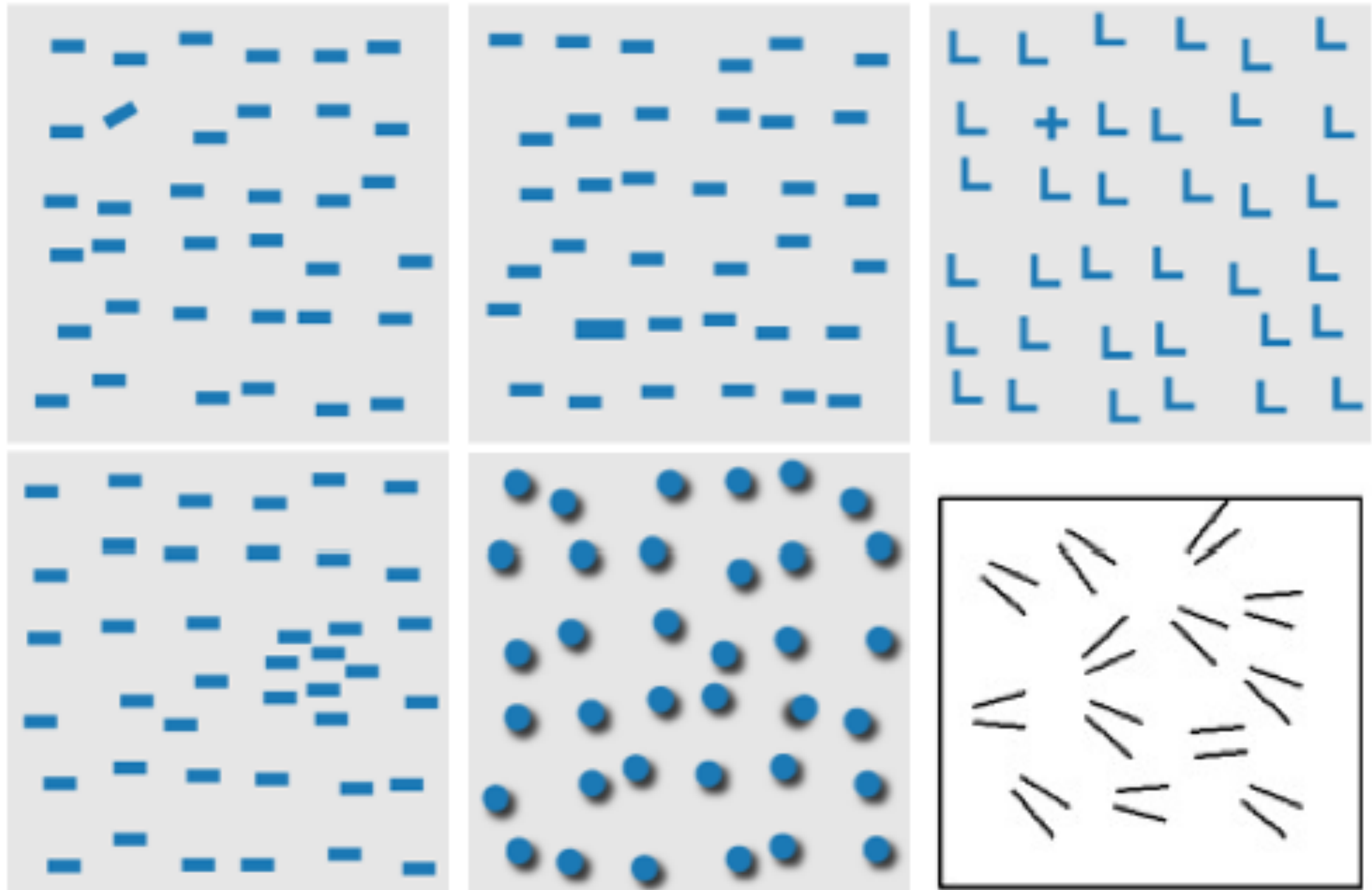


Popout - Preattentive processing

- parallel (visual processing)

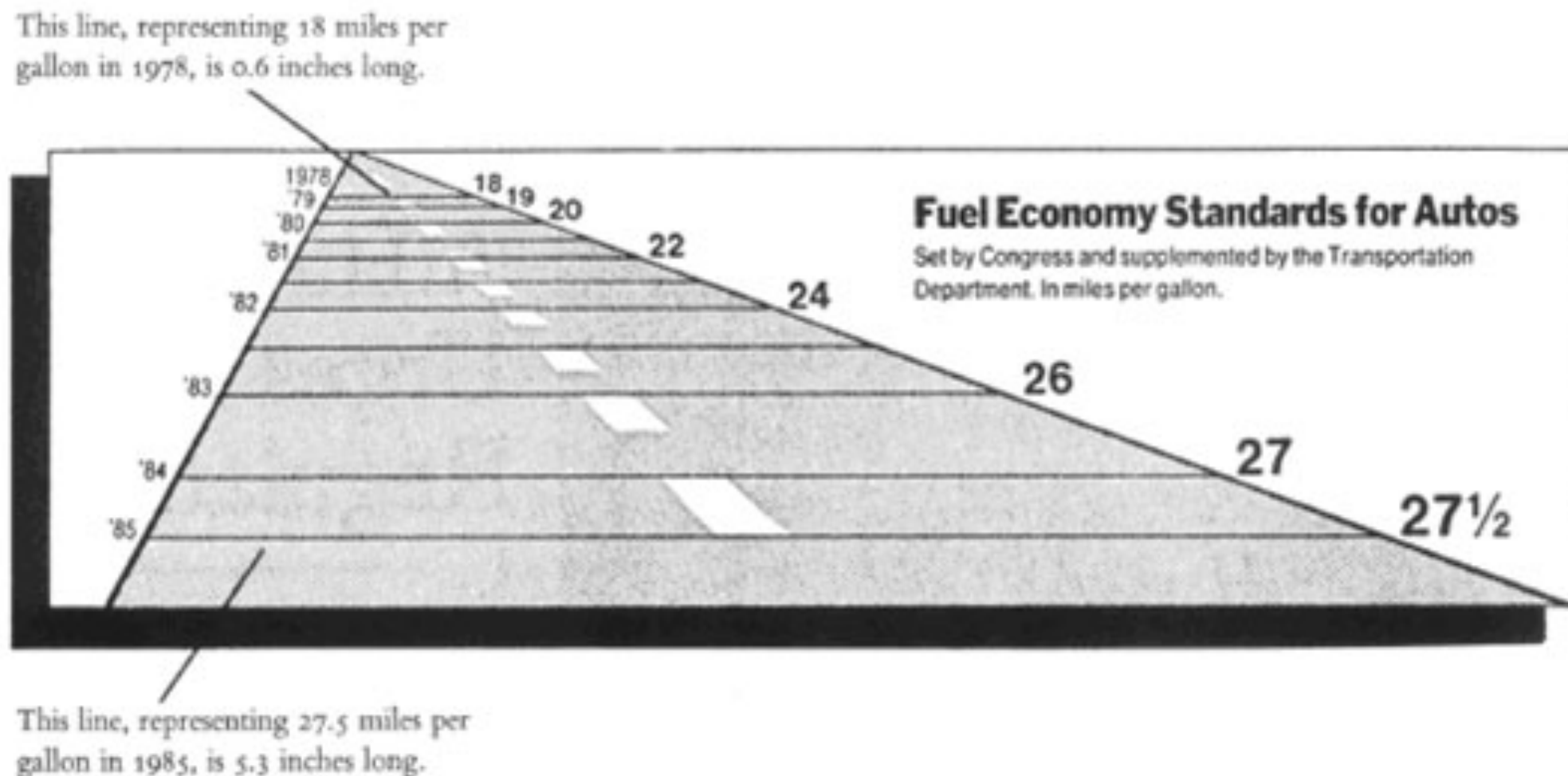


Popout - Preattentive processing



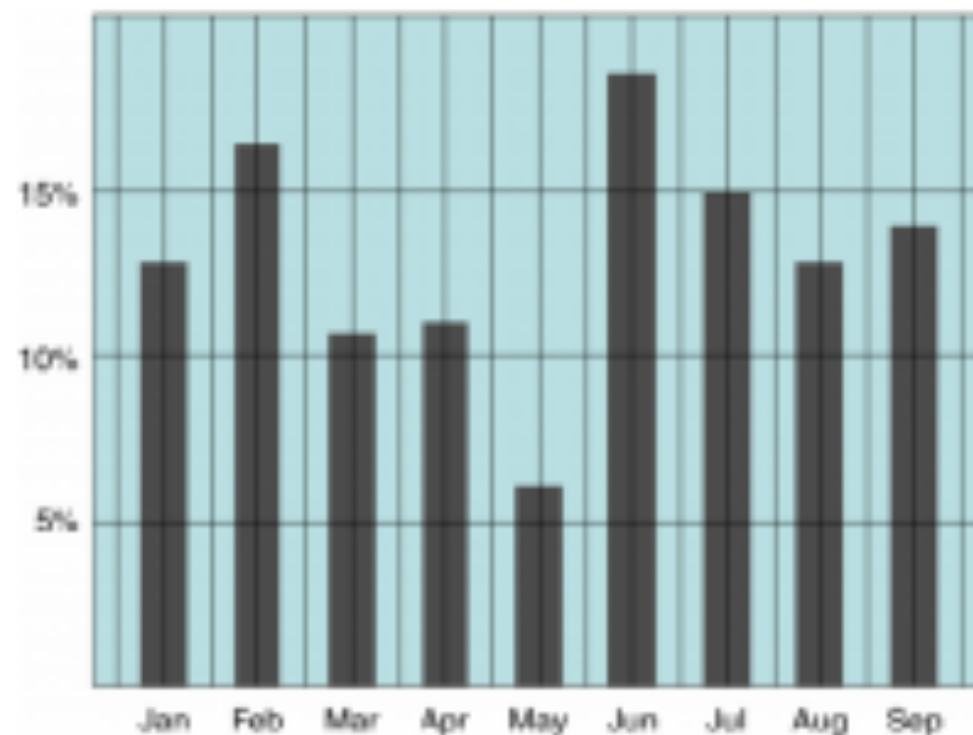
Expressiveness + Effectiveness

- expressiveness principle:
 - visual encoding should express all of, and only, the information in the dataset attributes
 - lie factor



Expressiveness + Effectiveness

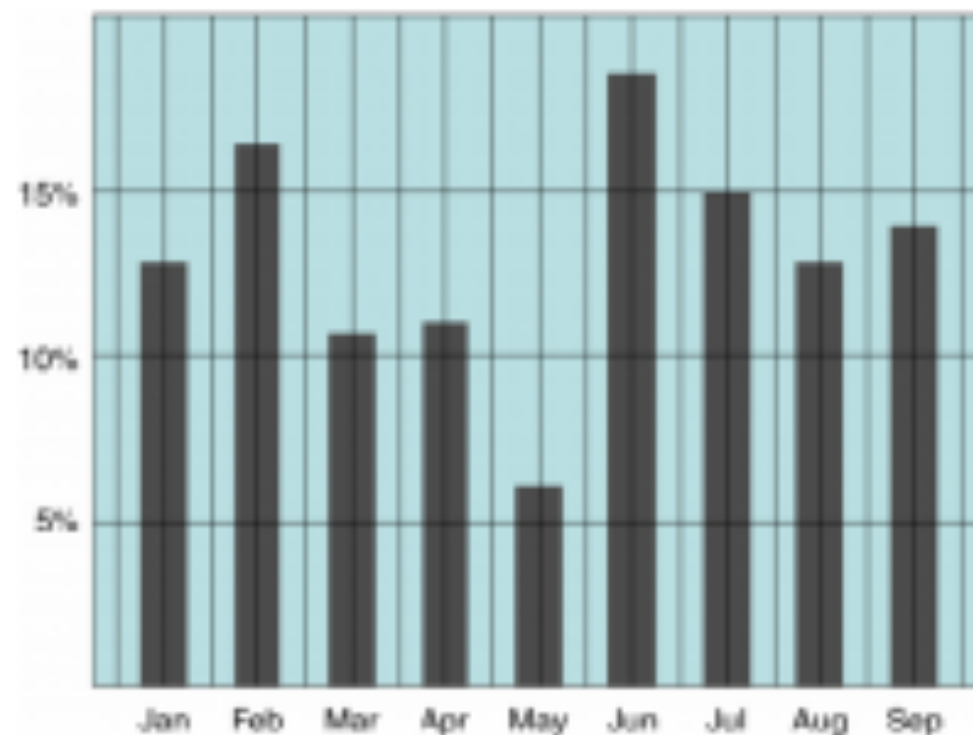
- effectiveness principle:
 - importance of the attribute should match the salience of the channel
 - data-ink ratio



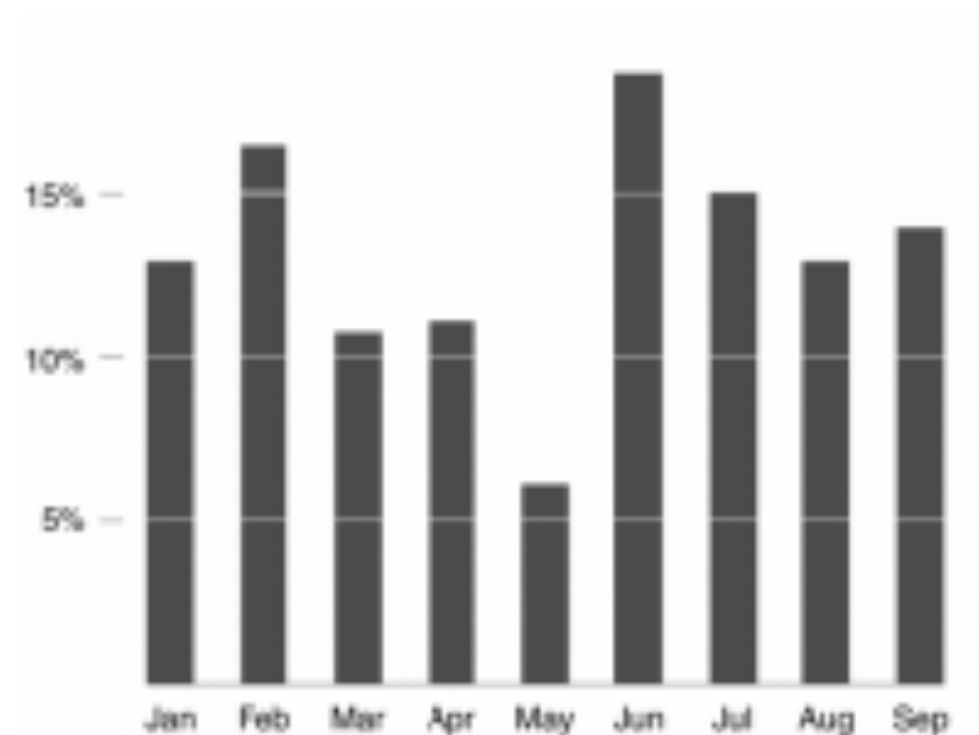
Low Data/Ink

Expressiveness + Effectiveness

- effectiveness principle:
 - importance of the attribute should match the salience of the channel
 - data-ink ratio



Low Data/Ink



High Data/Ink