Visualisation

Week 1
Variables and Aesthetics

Mapping Variables to Aesthetics

Variables Scales Aesthetics
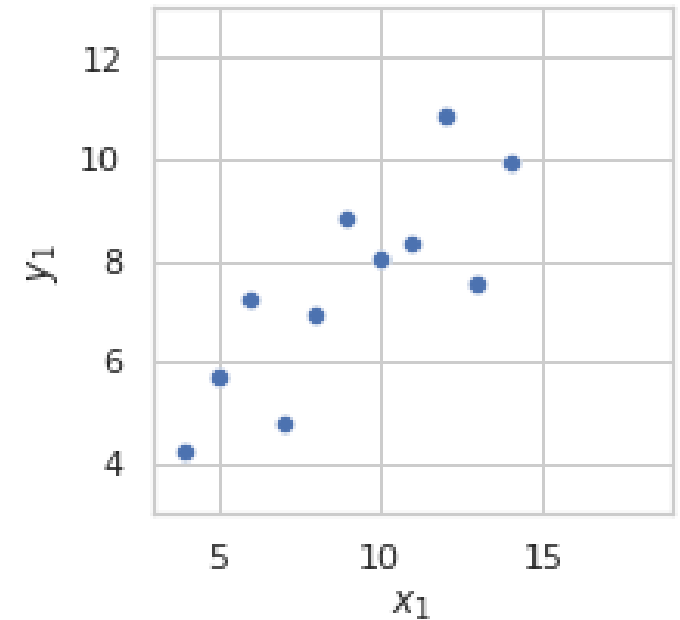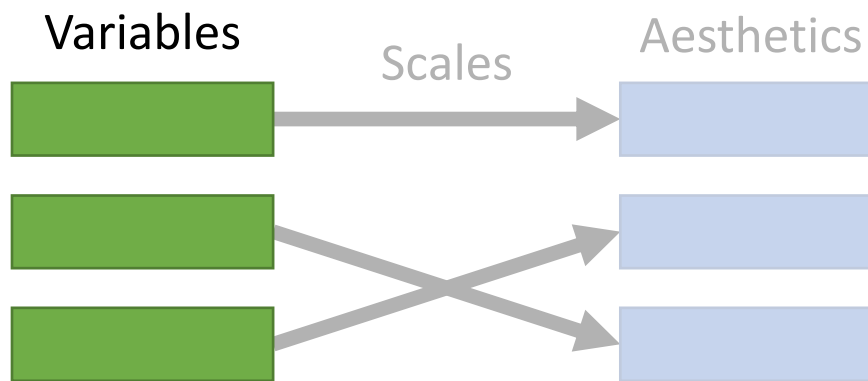
Numerical
aka
Quantitative

Categorical
aka
Qualitative

Continuous:
10.14, 14.1, 11.0, …
(e.g. temperatures)

Discrete:
1,2,3,… (indexes)
10, 13, 37, 4,… (counts)
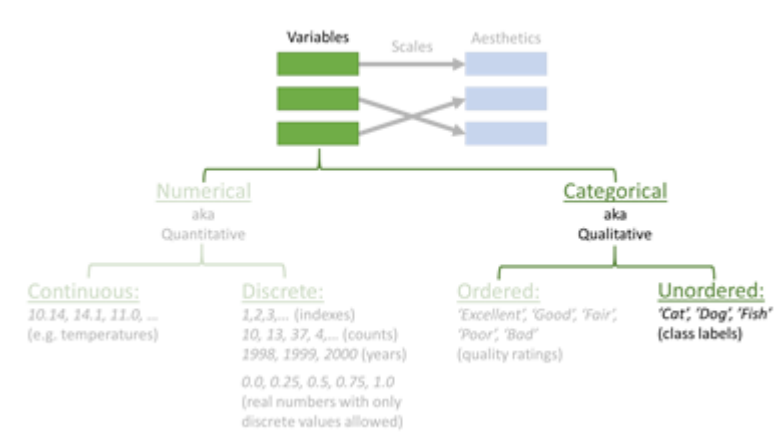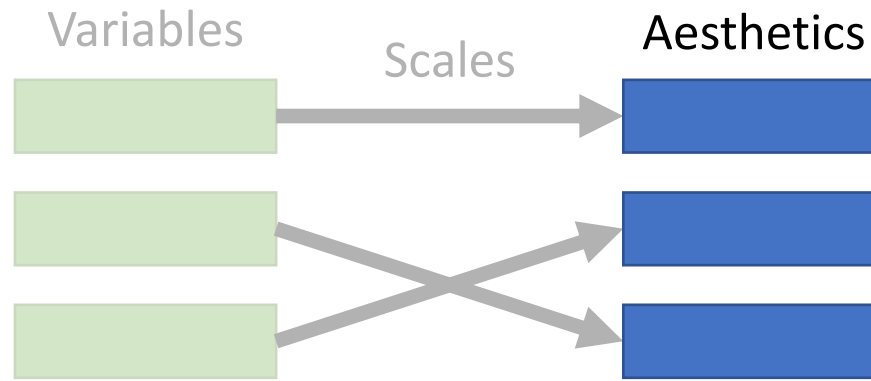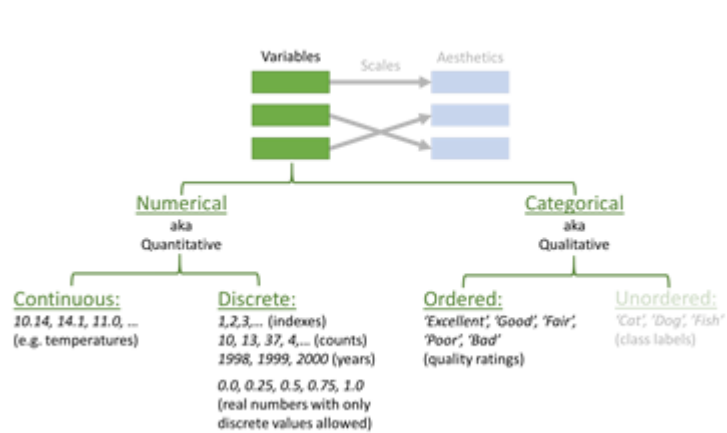*1998, 1999, 2000* (years)

0.0, 0.25, 0.5, 0.75, 1.0
(real numbers with only
discrete values allowed)

Ordered:
*'Excellent', 'Good', 'Fair',
'Poor', 'Bad'*
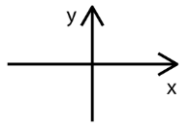(quality ratings)

Unordered:
'Cat', 'Dog', 'Fish'
(class labels)

Variables → **Scales** → **Aesthetics**

Ordered
(for **numerical** or **ordered categorical** variables)

Position   Size (area)   Tilt
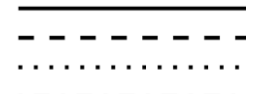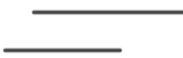
Length   3D volume   Curvature

Colour   Line width

Unordered
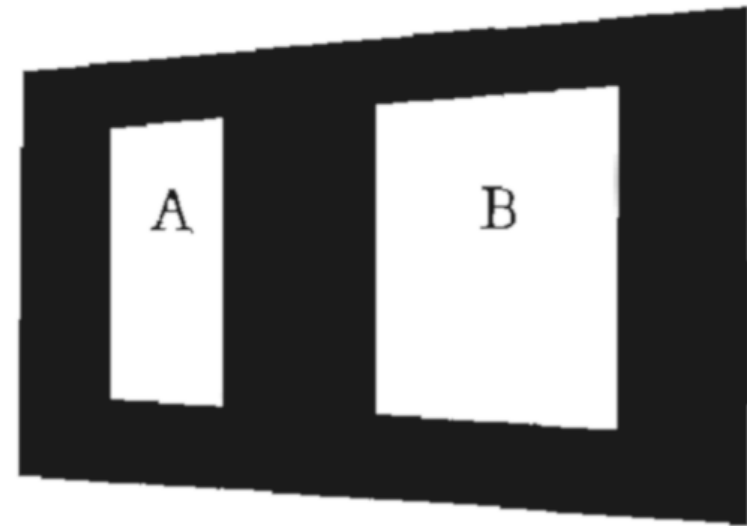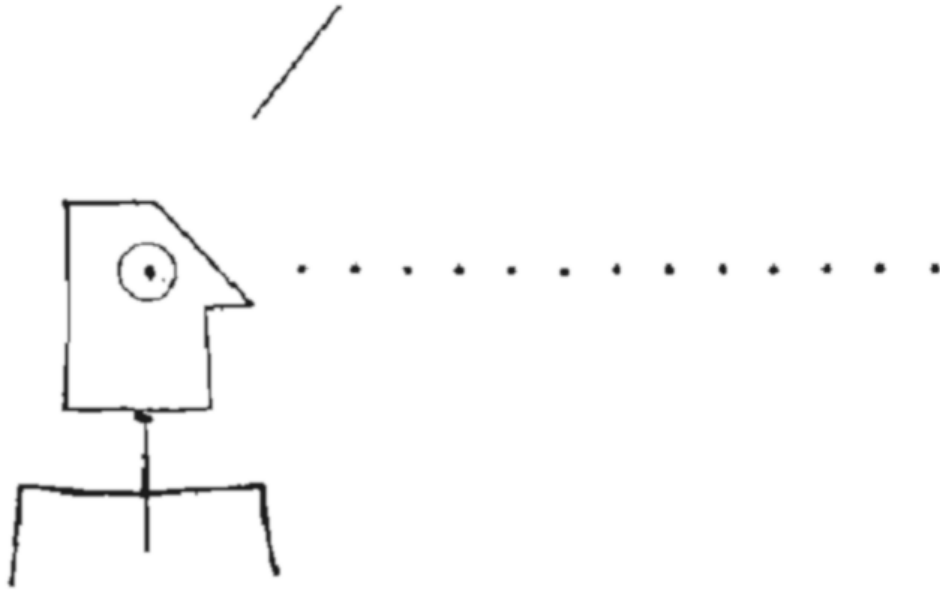(for **unordered categorical** variables)

Shape   Line style

Colour

4
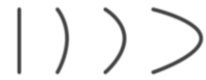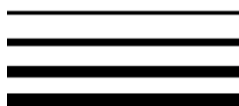
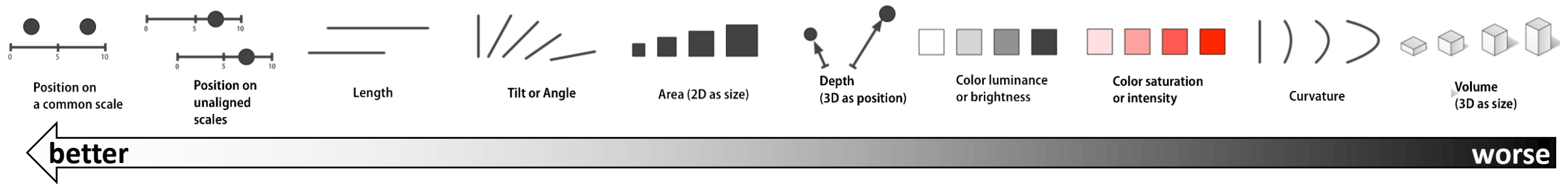# Are Some Aesthetics Better than Others?

I think I see that area B
is 3.14 times bigger than
area A. Is that correct?

A

B

Edward Tufte
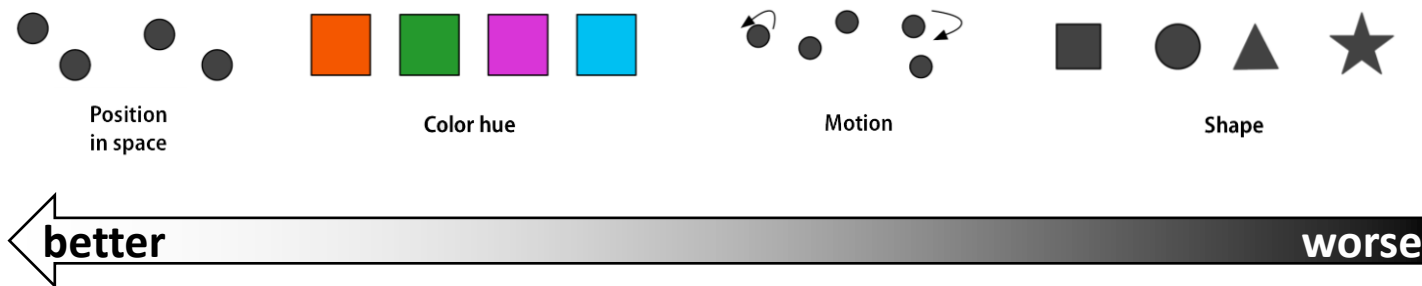
Are some aesthetics better than others?
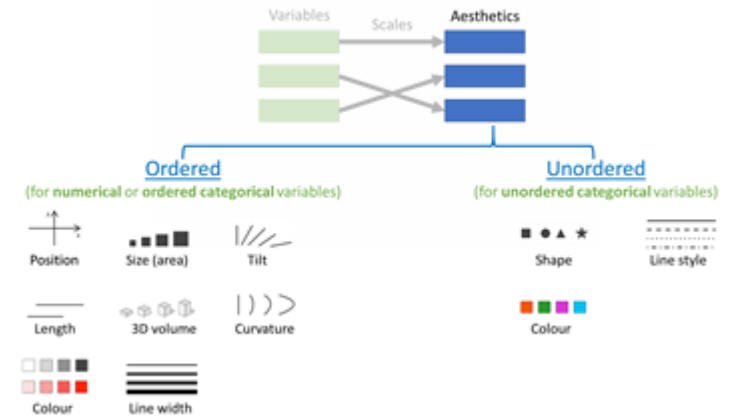
Ordered aesthetics:

| Position on a common scale | Position on unaligned scales | Length | Tilt or Angle | Area (2D as size) | Depth (3D as position) | Color luminance or brightness | Color saturation or intensity | Curvature | Volume (3D as size) |

better ⟵ ⟶ worse

Unordered aesthetics:

| Position in space | Color hue | Motion | Shape |

better ⟵ ⟶ worse
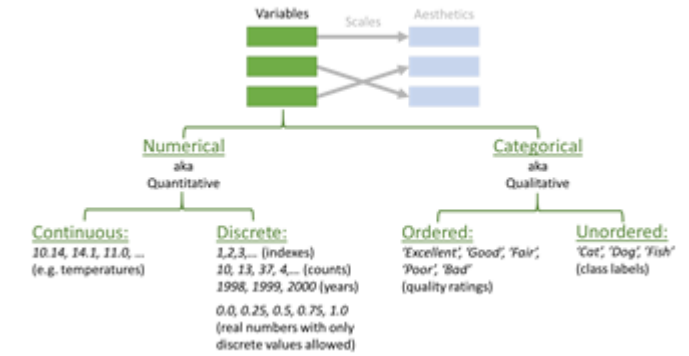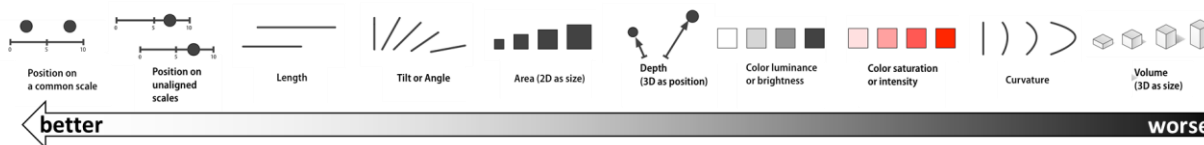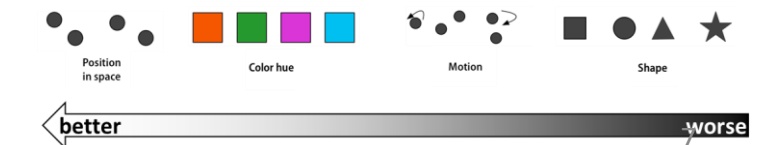
Summary

- Variables can be categorised.
  - Numerical, categorical
  - Continuous, discrete
  - Ordered, unordered

- Aesthetics are not created equal.
  - Ordered, unordered
  - Position and length most accurate.
  - Area and volume not so good.

What's Next?

Variables   Scales   Aesthetics