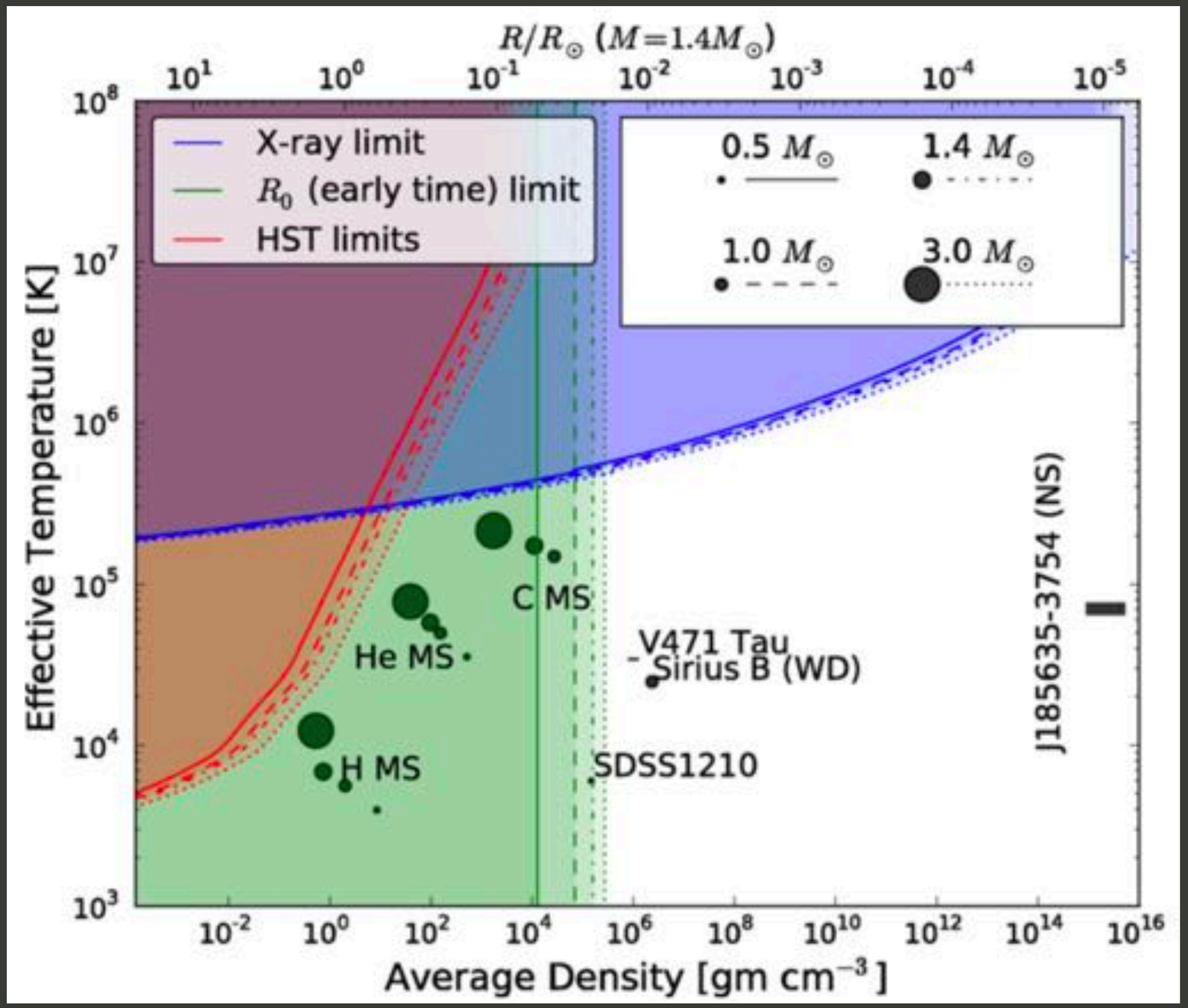


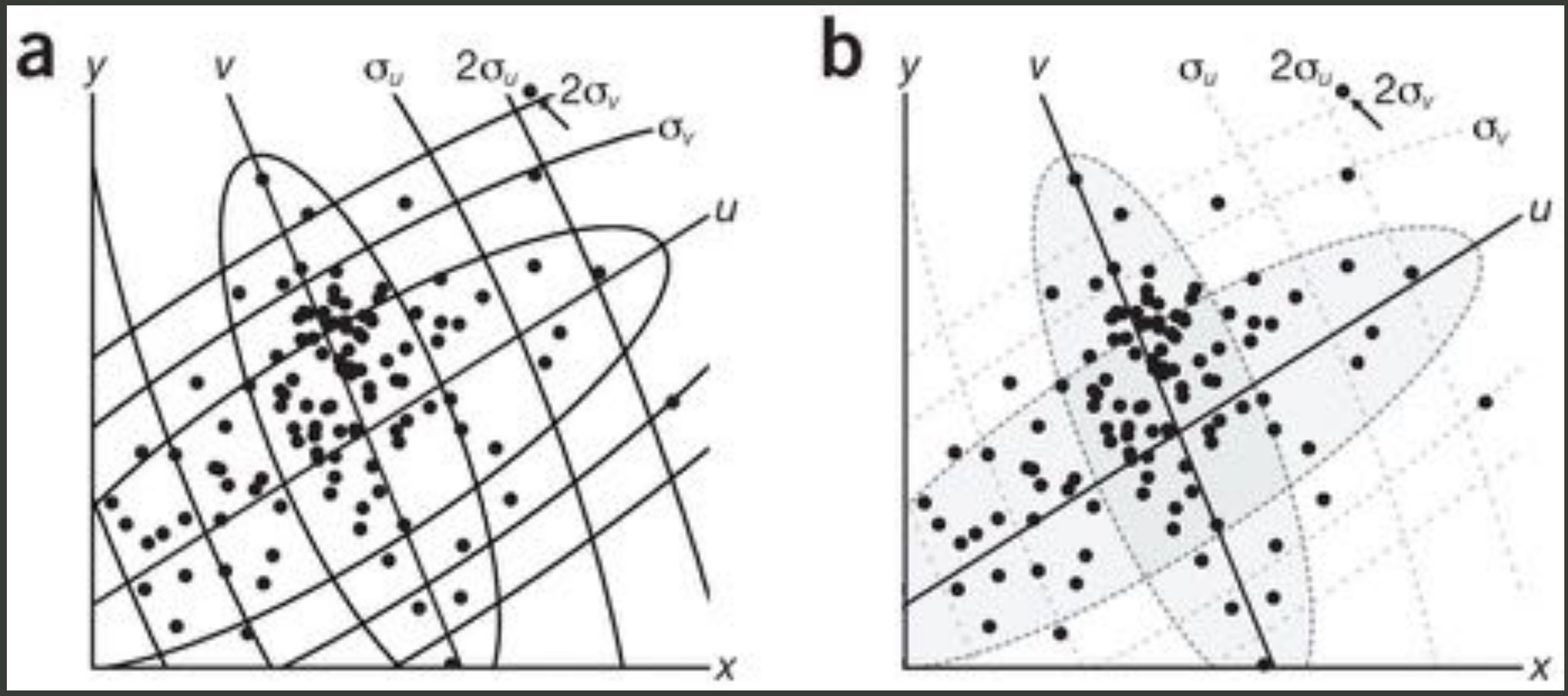
Upper limits obtained in the hours after explosion for SN 2011fe enable precise constraints on the radius of the progenitor star when compared to expectations from shock break-out models. Combined with pre-explosion limits on the temperature of the progenitor, it is possible to definitively conclude that a WD must have exploded for this type Ia SN.

Bloom+12

Human brain is not a multiprocessor

Information transmission needs to be efficient
Impossible to simultaneously read *and* listen

Building Visualizations via Principles of Design



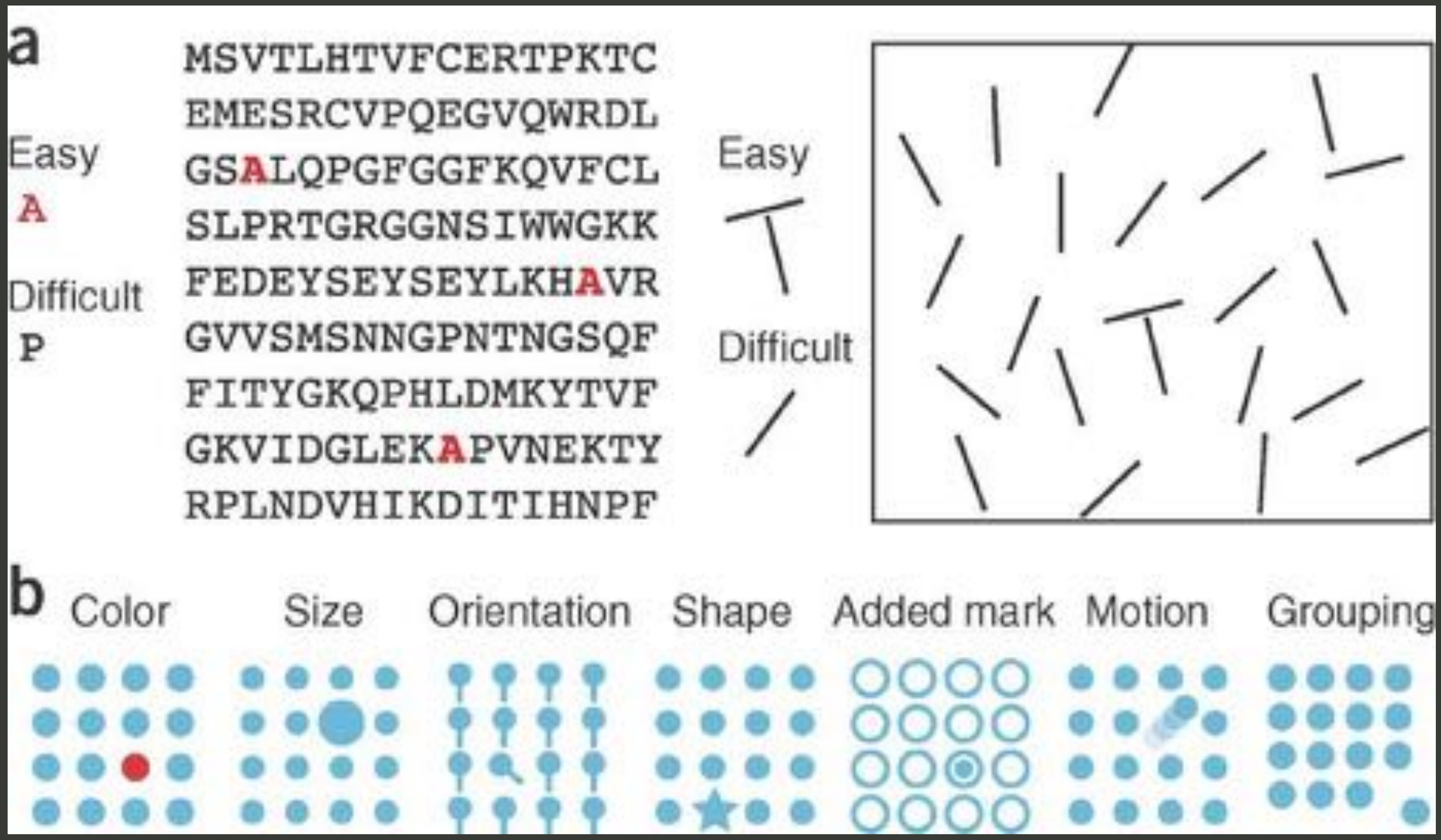
Adam A Miller
CIERA/Northwestern & Adler Planetarium

LSSTC DSFP Session 10
07 Sep 2019

Krzywinski, Nature Methods, 2013

Salience

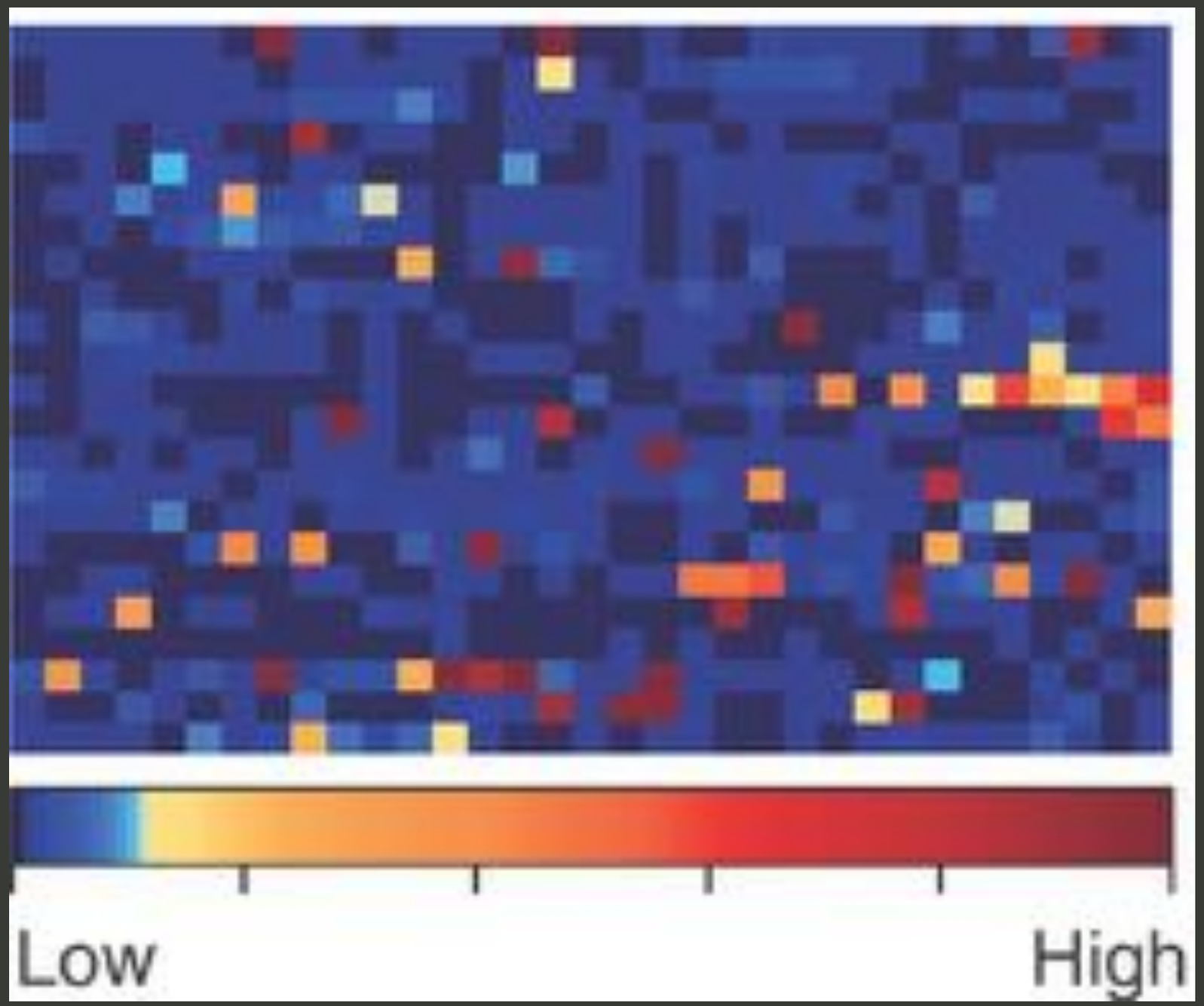
Things that stand out are easy to find



Wong, Nature Methods, 2010

Salience

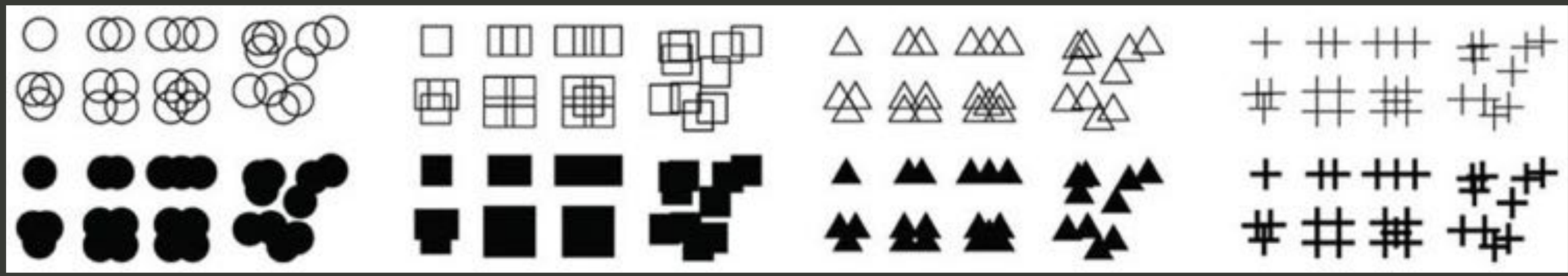
Salience must match relevance



Wong, Nature Methods, 2010

Symbols

Hollow circle is the most flexible and robust



Symbols

Form strong visual boundaries

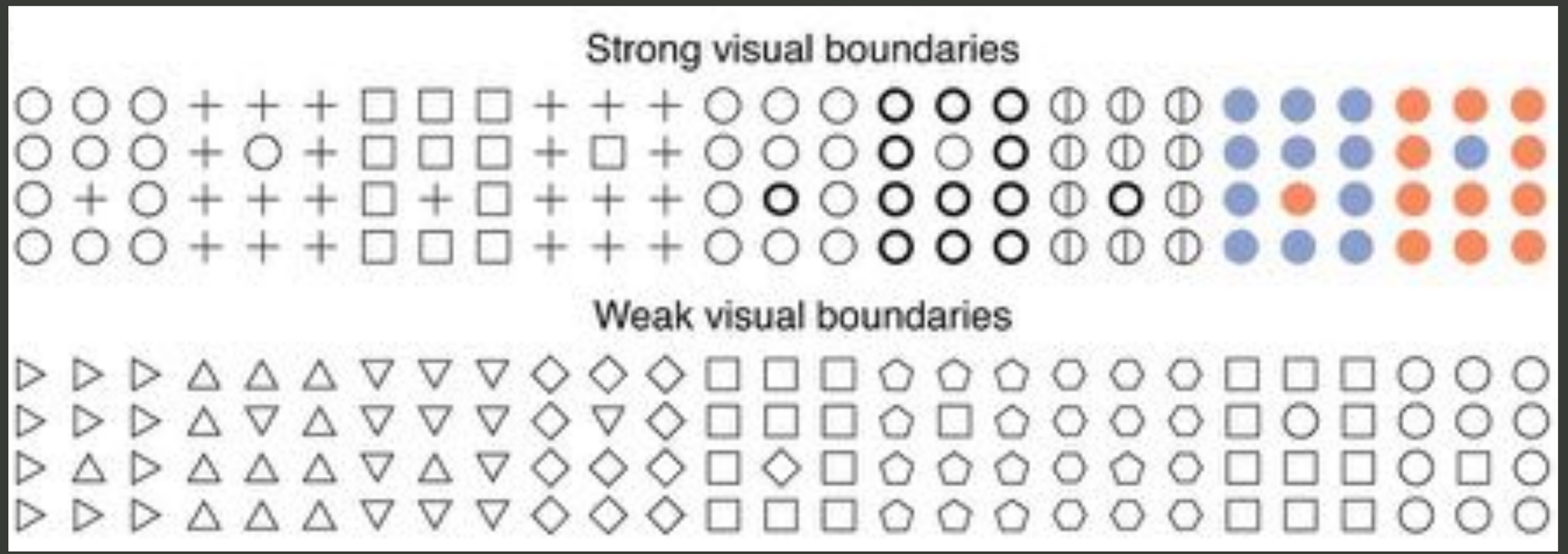


Figure Design

Use easy-to-estimate visual representations

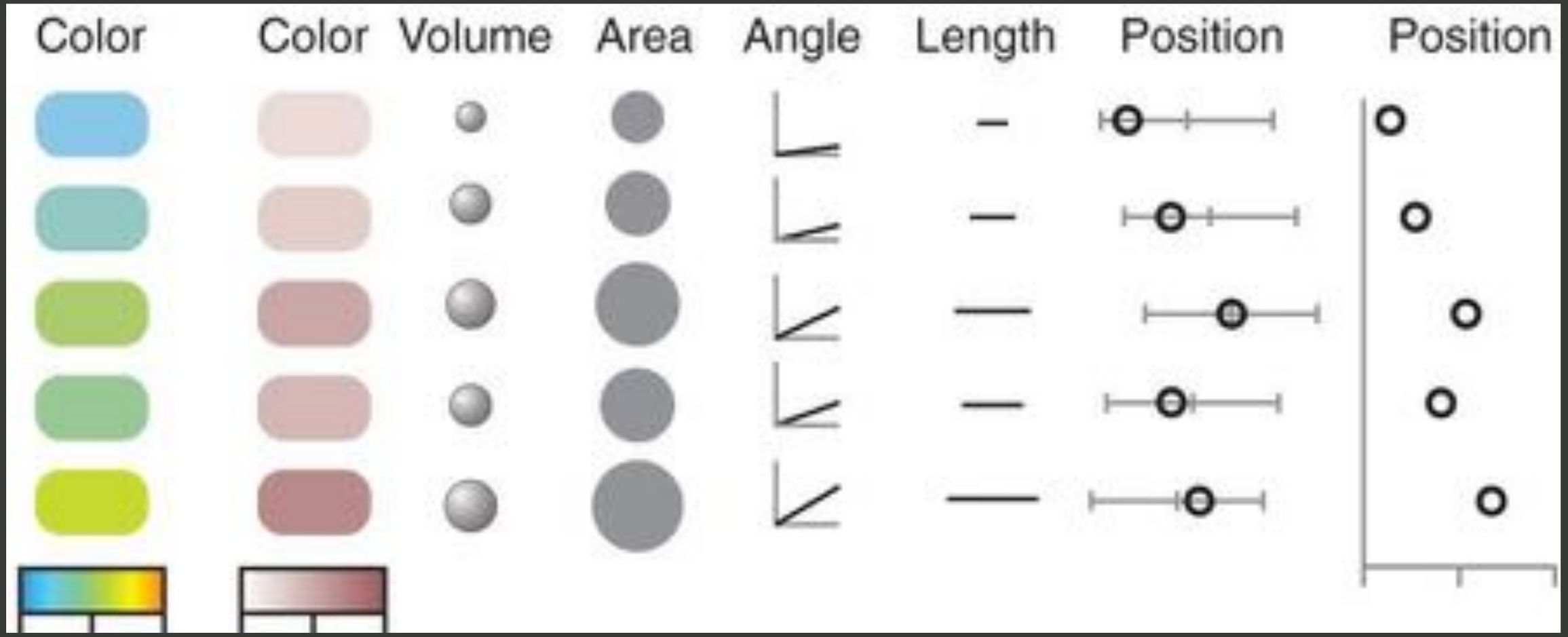
Rank	Aspect to Compare
1	Positions on a common scale
2	Positions on the same but nonaligned scales
3	Lengths
4	Angles, slopes
5	Area
6	Volume, color saturation
7	Hue

Cleveland & McGill 1985

Figure Design

Use easy-to-estimate visual representations

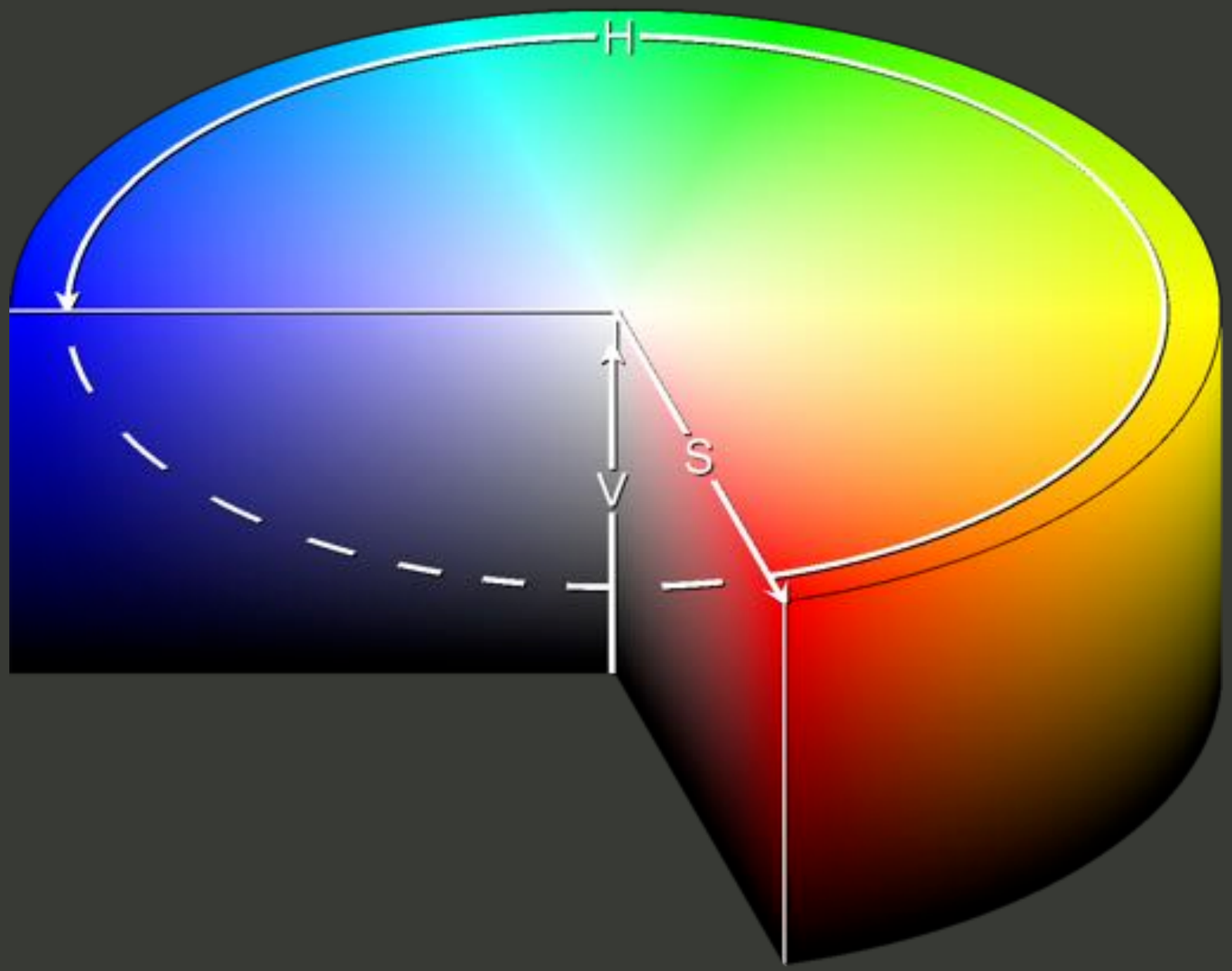
positions = easy
colors = hard



Wong, Nature Methods, 2010

Color

Color defined by hue, saturation, lightness

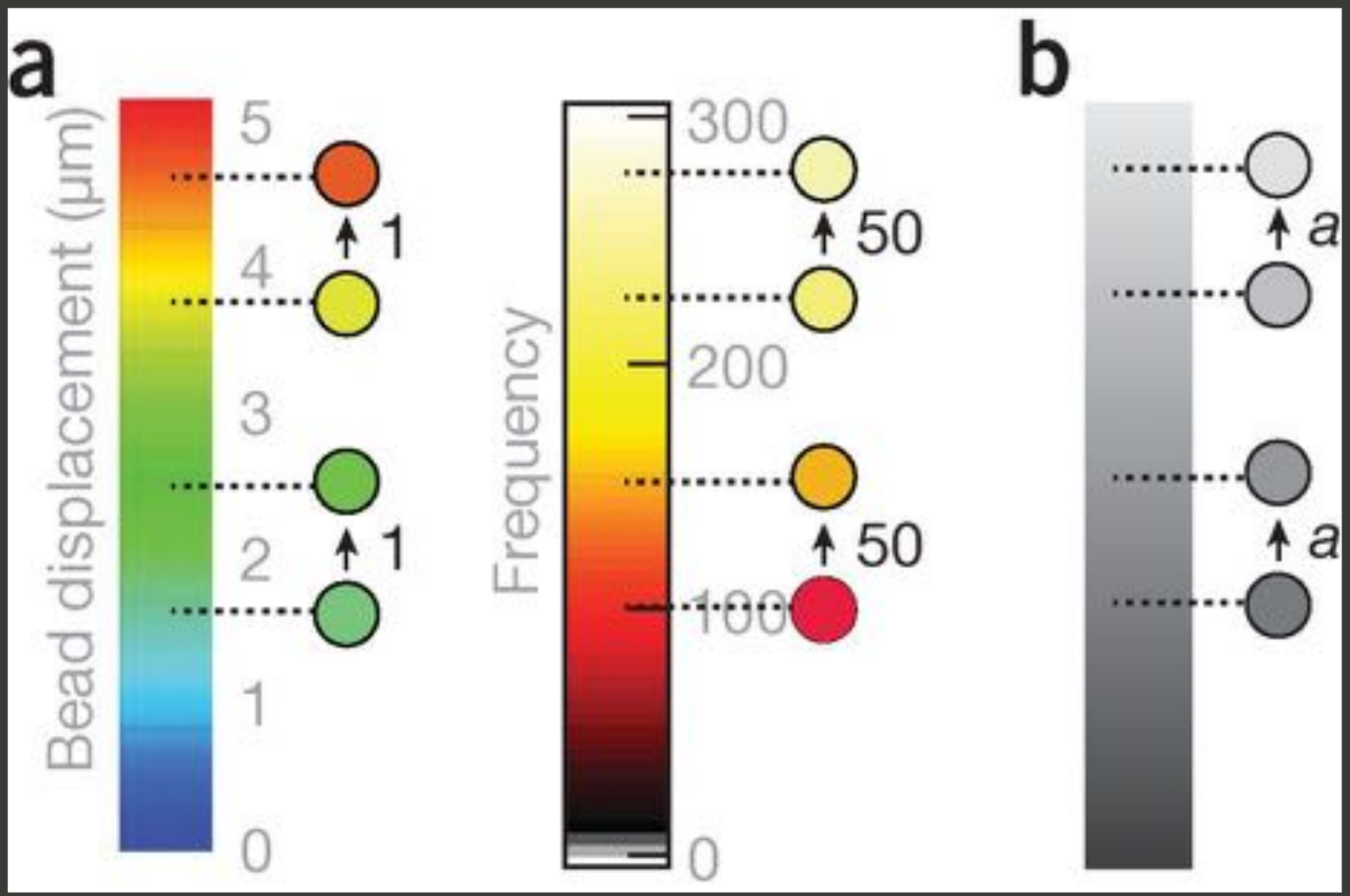


best for categorical data
>6 = hard to interpret

wiki commons

Color

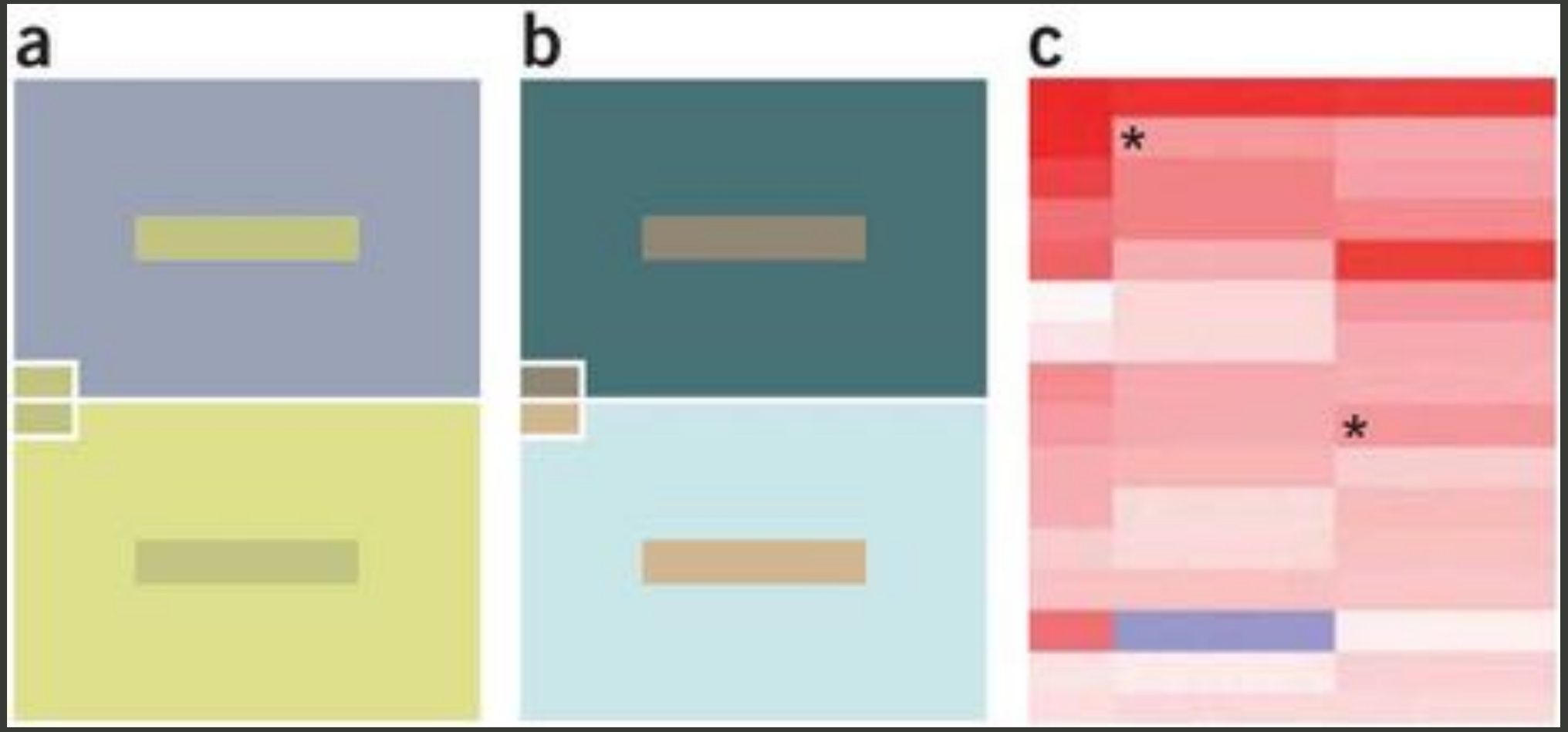
Hue does a poor job encoding relative numerical values



Wong, Nature Methods, 2010

Color

Color perception depends on context



Wong, Nature Methods, 2010

Color

Select semantically resonant colors

banana

anger

money

sky

Lin+13

Color

Select semantically resonant colors

banana

anger

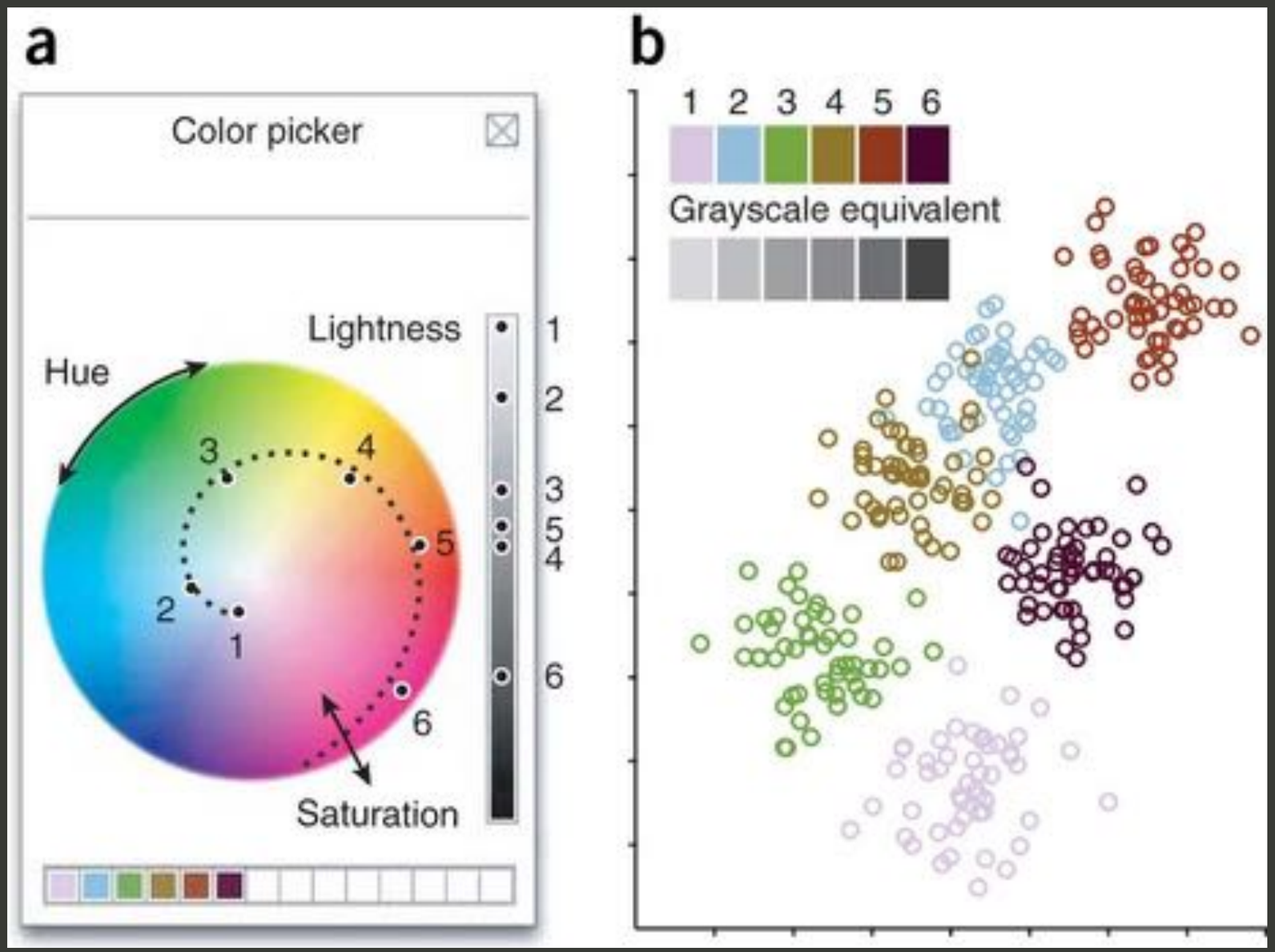
money

sky

Lin+13

Color

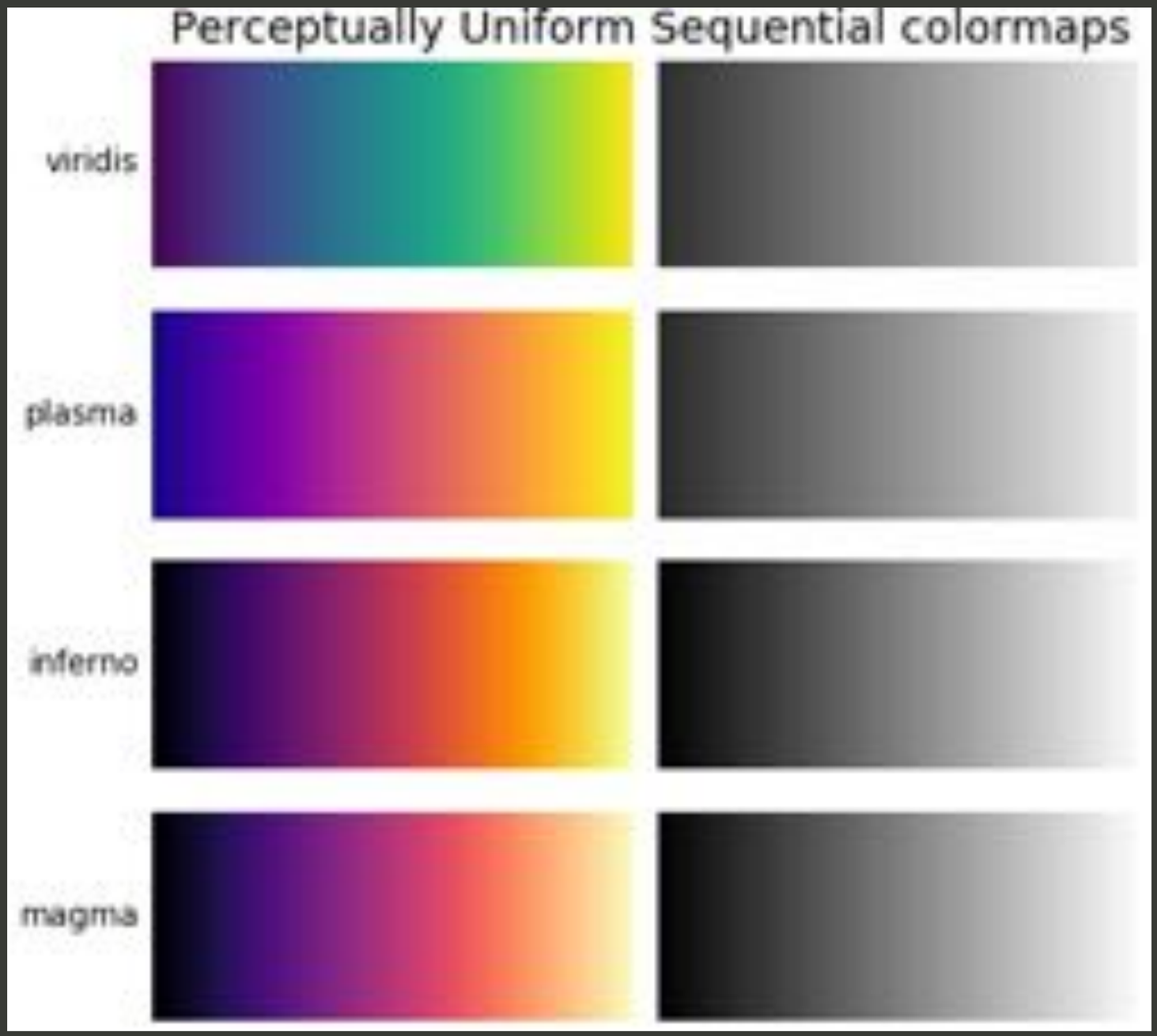
Rotate through color wheel for categorical selection



Wong, Nature Methods, 2010

Color

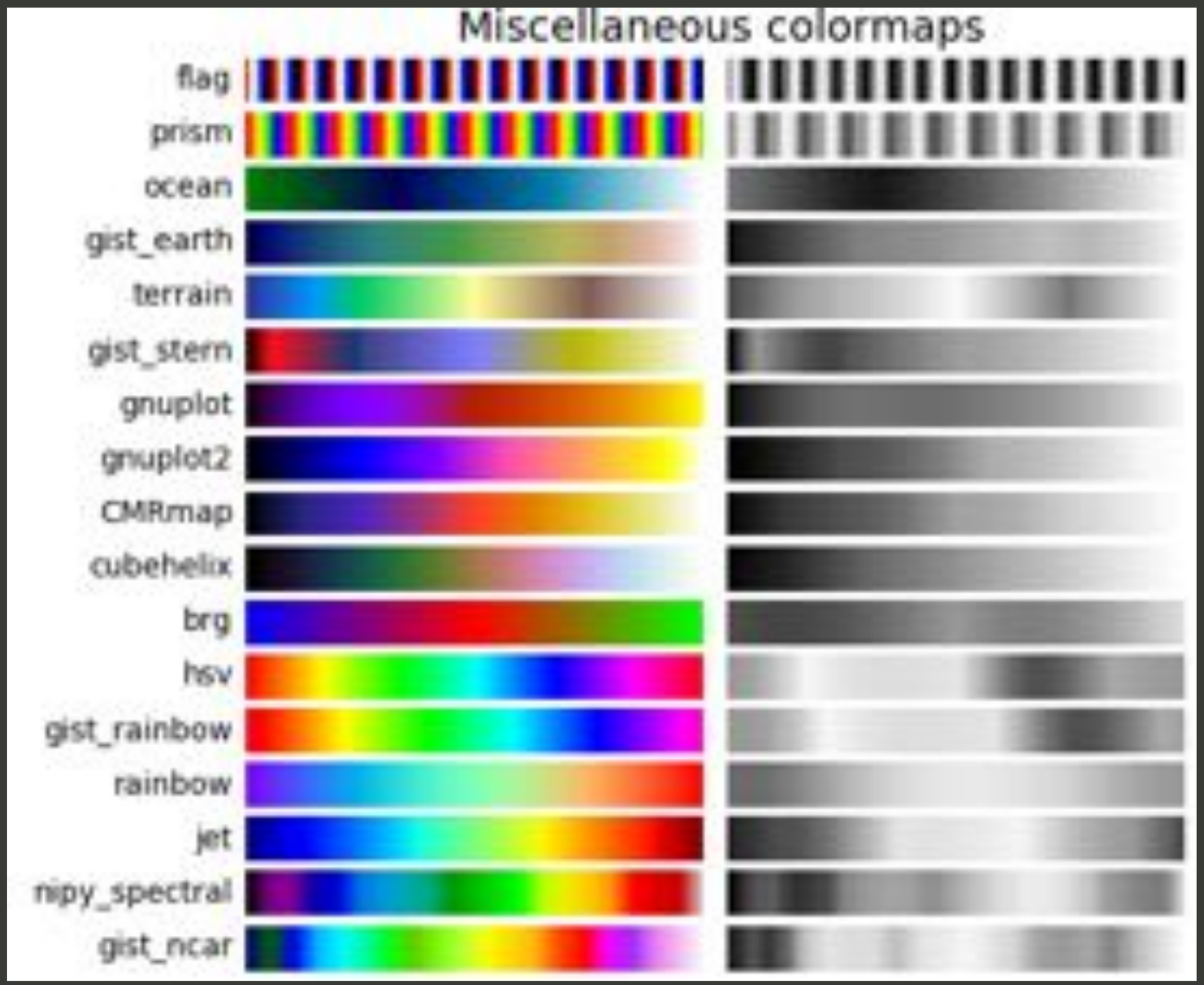
What does it look like in greyscale?



matplotlib

Color

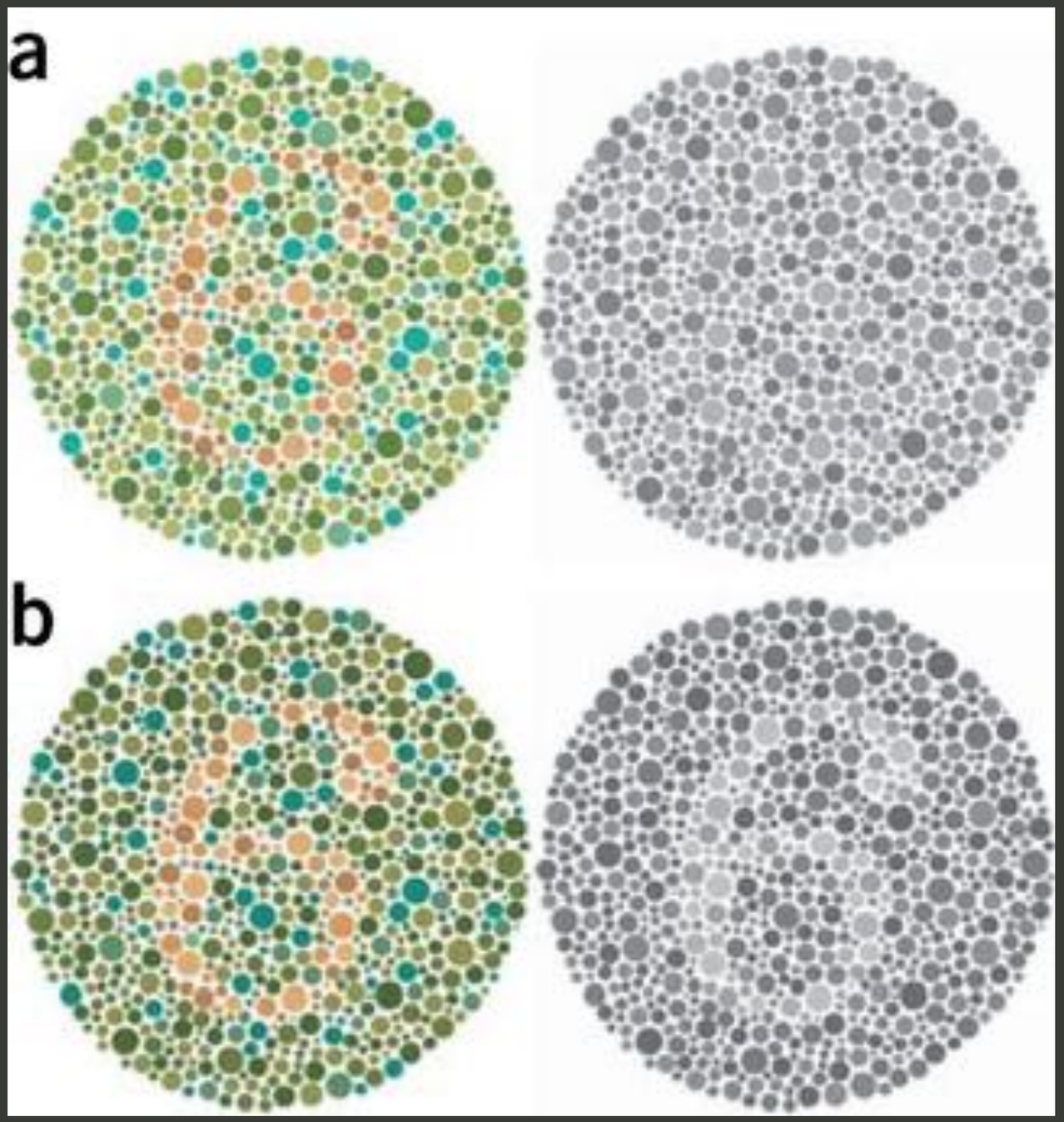
What does it look like in greyscale?



matplotlib

Color

How does it look to the color blind?



Wong, Nature Methods, 2010

Color

If you must…

use colorbrewer2.org to select colorblind friendly palettes

use shapes to better highlight salience

select semantically resonant colors

consider background colors and how this affects final appearance