COLOURS IN DATA VISUALIZATION

Unlocking the Power of **Color** in Data **Visualization**

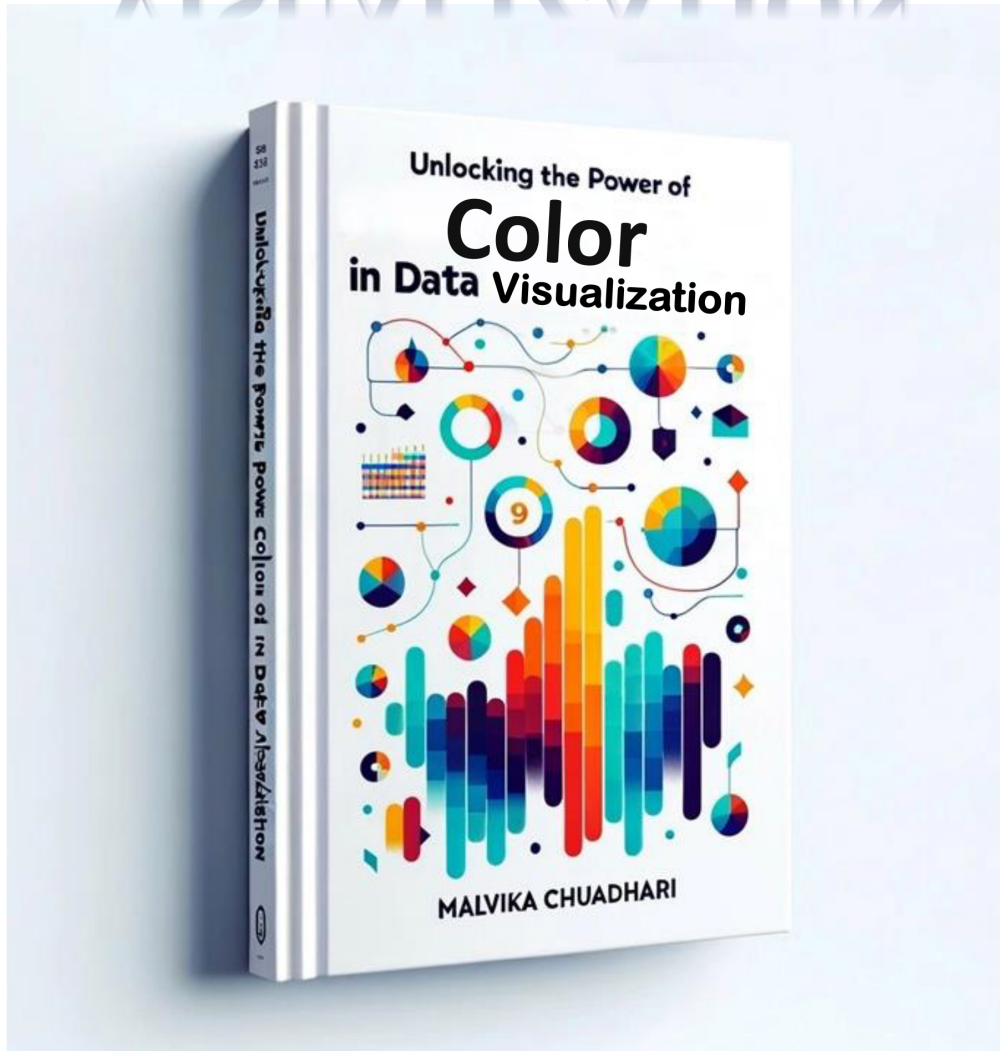MALVIKA CHUADHARI

Discover how the strategic use of color can transform your data visualizations from good to great. In this series, we'll explore key principles like intuitiveness, moderation, consistency, clarity, classification, explainability, and color schemes to help you make more impactful and understandable charts. Join me, Malvika Chaudhari, as we dive into the world of color and data!

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INTUITIVENESS

Use intuitive colors. When choosing them, consider what associations do they evoke. If possible, use colors that audience will associate with your data anyway.
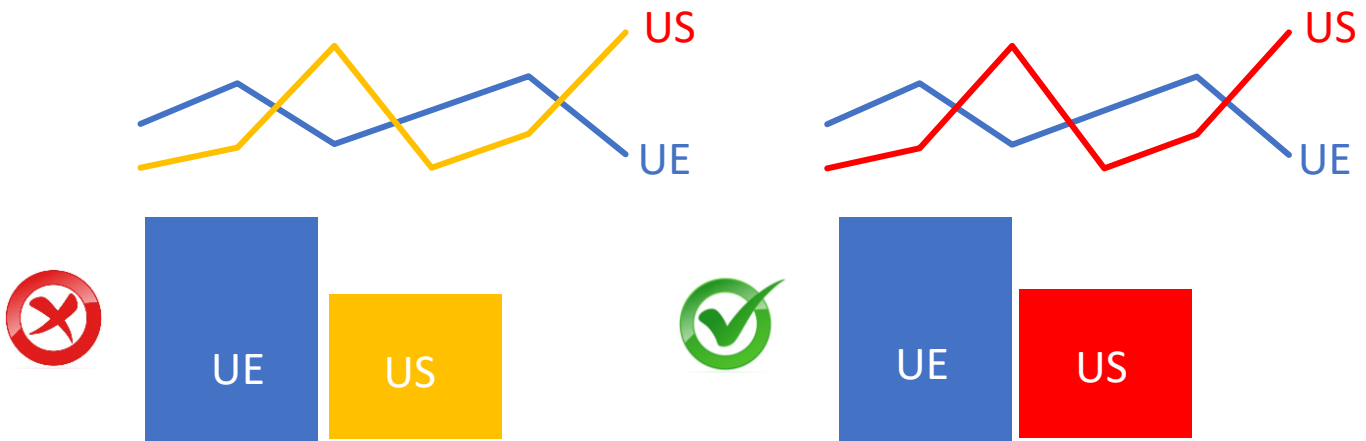

MODERATION

Use colours in moderation. For a simple dataset, a single colour is preferable. Use colour as a strategic tool to highlight the important parts of your visual.
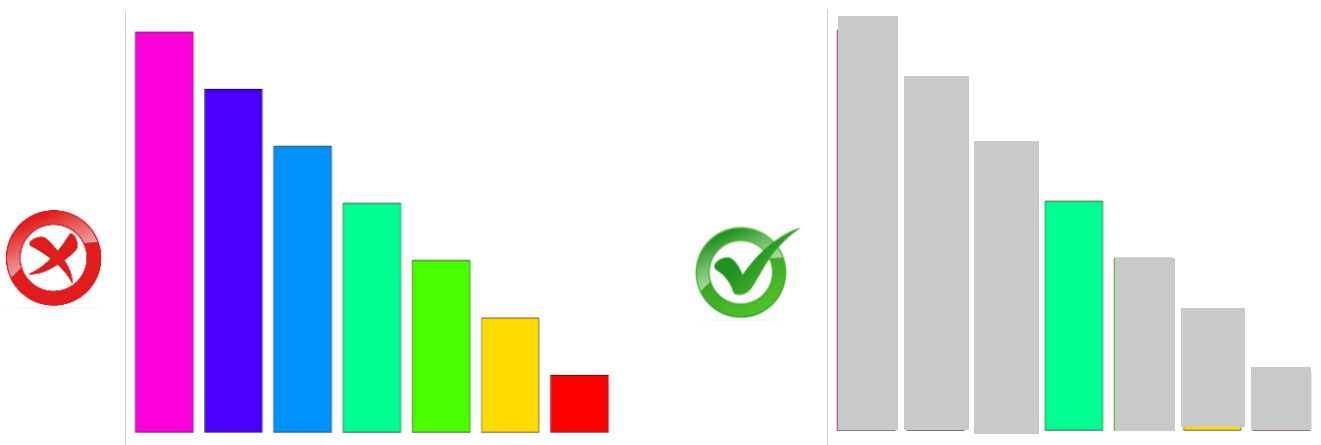
CONSISTENCY

Use colours consistently. Change colours if you want your audience to feel the change for the specific reason, but never simply for the sake of novelty.
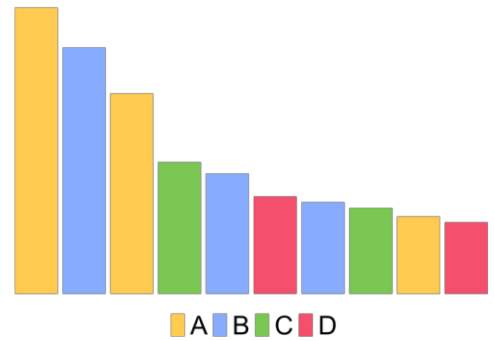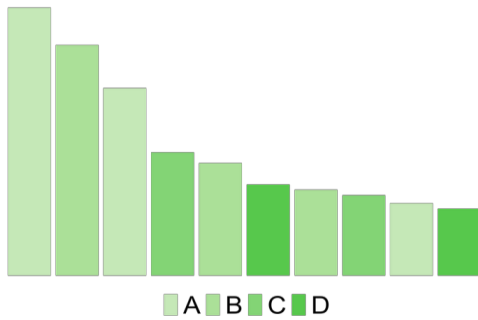

CLARITY

Use colours to make the data easier to read. Make sure your audience will be able to distinguish between the items shown in the visualization.
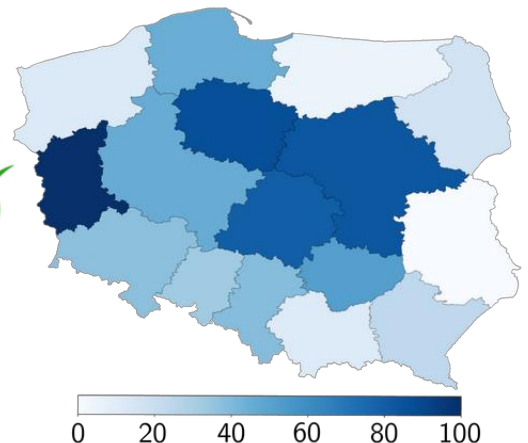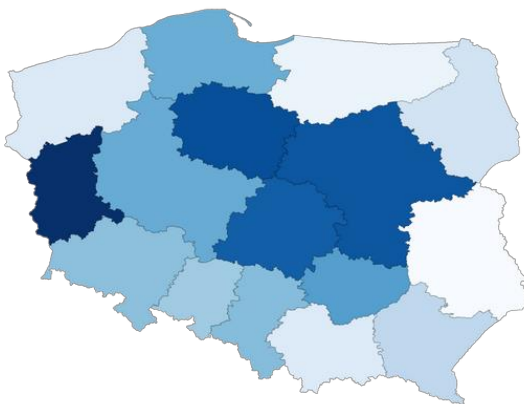
CLASSIFICATION

Don't use a gradient colour palette for categories. And the other way round-different colours for same measurement.
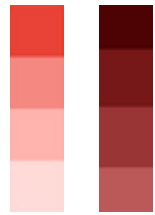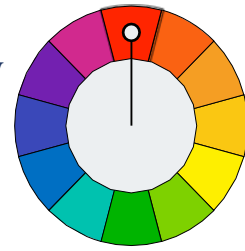

EXPLAINABILITY

Make sure to explain to your audience what exactly used colours mean Remember to create a colour key.
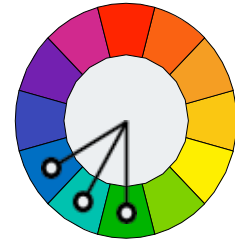
COLOUR SCHEMES

Monochromatic - the simplest formula for harmony is monochromatic. Consists of different shades of one hue. Not a good choice if we want to highlight something.

Analogous - this scheme is composed of colors that are next to each other on the wheel. Usually they match up pretty well, making elegant and clear look.

Complementary - uses two colors which are opposite on the color wheel. With saturated colors makes very vibrant look. Try to tone down colors to avoid over vibrance, by adjusting saturation and lightness/darkness. Do not use with text with saturated colors.
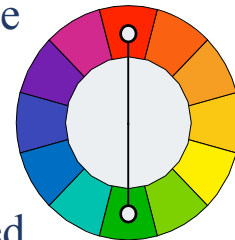
Triadic - uses three colors that evenly spaced on the color wheel. Makes that none of colors is dominant and quite vibrant look.
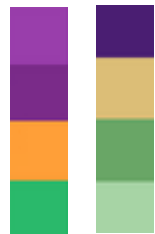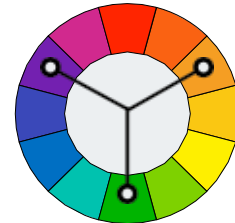
Split-Complementary - variation of complementary scheme. Uses base color and two adjacent to its complementary color. Often this scheme is more pleasant to the eye than usual complementary scheme.
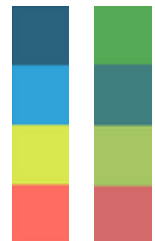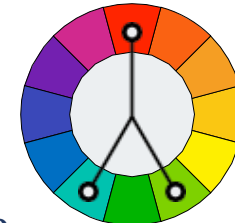
Tetradic - this scheme consists of four colors, two of them are complementary to other two. Choosing one color as dominant and the rest as accents, gives the best result.
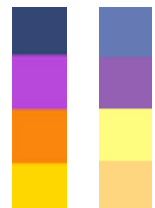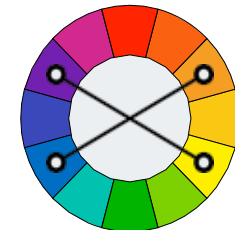
Remember! Do not stick strictly to colors imposed by a scheme. These patterns are just starting points, you can create your own variations based on schemes above. Check also: paletton.com

COLOR PALETTES

QUANTITATIVE DATA - SEQUENTIAL OR DIVERGING COLORS

Color is used show variations in the data. The palette contains a sequence of colors that clearly indicate which values are larger or smaller than which other ones (sequential scale). It can also visualize the deviation of data values in one of two directions relative to a neutral midpoint (diverging scale). Diverging scale can be viewed as two merged sequential scales.

Sequential scales

Blues
Viridis
YlOrBr

Diverging scales

PiYG
RdBu
BrBG
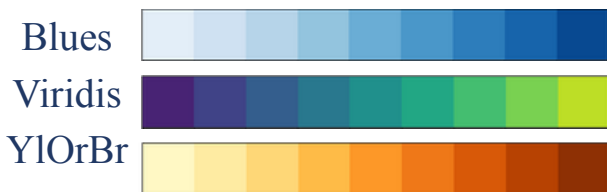
CATEGORICAL DATA - QUALITATIVE COLORS
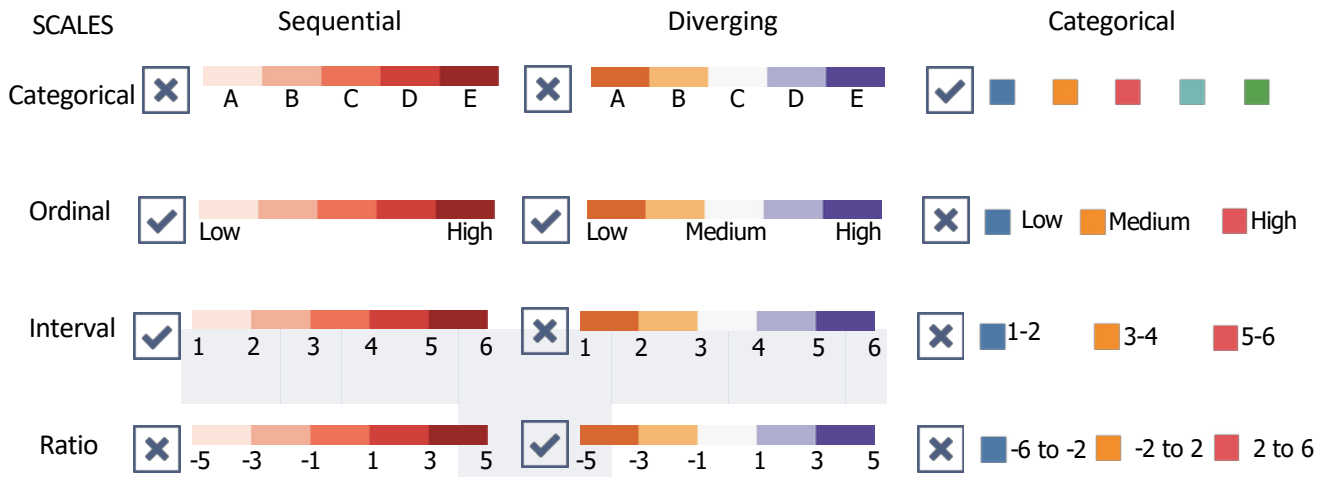
Color is used to separate areas into distinct categories. The palette should consist of colors as distinct from one another as possible. The maximum number of categories that can be displayed is about 12 (practically speaking, probably fewer).

Colorblind
Set2

Accent
Pastel1

All examples are available in Seaborn library. Check also:
medialab.github.io/iwanthue/

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USAGE GUIDELINES

SCALES

	Sequential	Diverging	Categorical
Categorical	✖ A B C D E	✖ A B C D E	✔ ▪ ▪ ▪ ▪ ▪
Ordinal	✔ Low ... High	✔ Low ... Medium ... High	✖ ▪ Low ▪ Medium ▪ High
Interval	✔ 1 2 3 4 5 6	✖ 1 2 3 4 5 6	✖ ▪ 1-2 ▪ 3-4 ▪ 5-6
Ratio	✖ -5 -3 -1 1 3 5	✔ -5 -3 -1 1 3 5	✖ ▪ -6 to -2 ▪ -2 to 2 ▪ 2 to 6

PRO TIPS

The color grey is the most important color in data visualization.

The use of color should always be an intentional decision. Never let your tool make this important decision for you!

After creating your visualization, close your eyes and then look back at it, taking note of where your eyes are drawn first. Is it where you want your audience to focus?

When picking colors consider the connotations colors have in other cultures. You can check: informationisbeautiful.net/visualizations/colours-in-cultures Remember about color deficiency issues (color blindness).

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