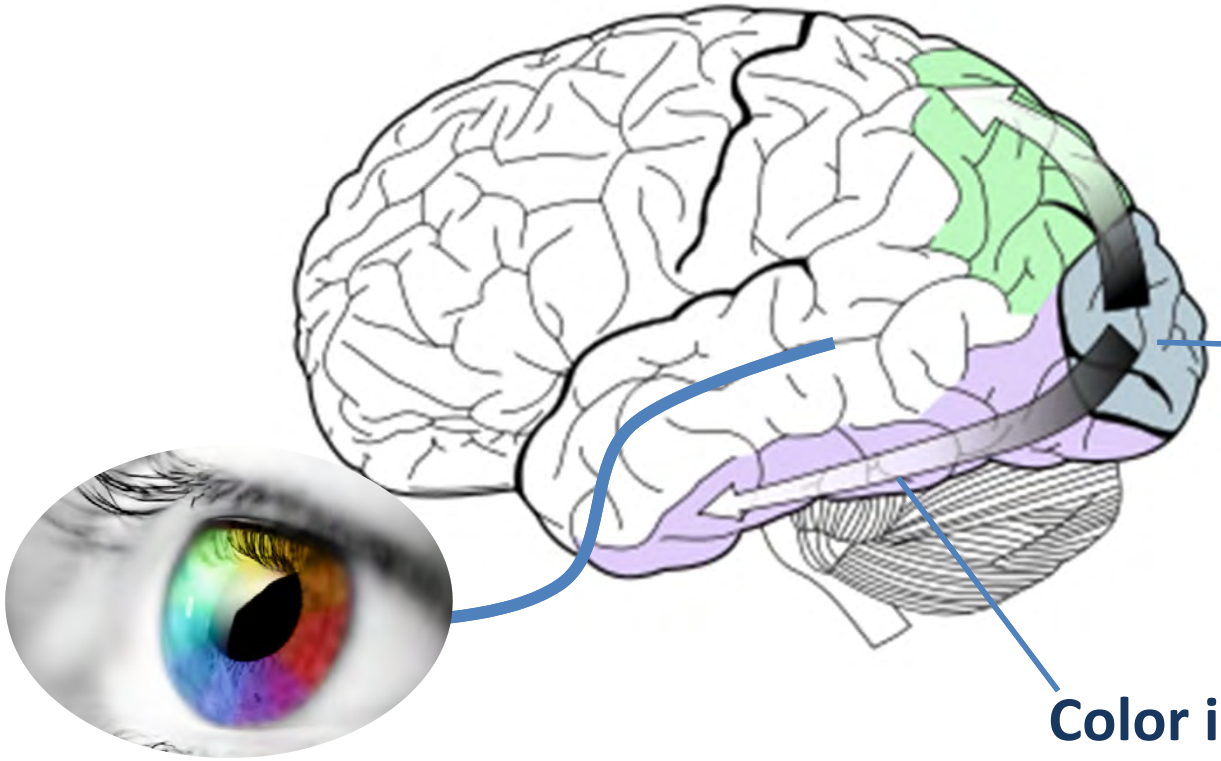
Color – an enormously complex topic.

Kosslyn (2006) ***Graph Design for the Eye and Mind***

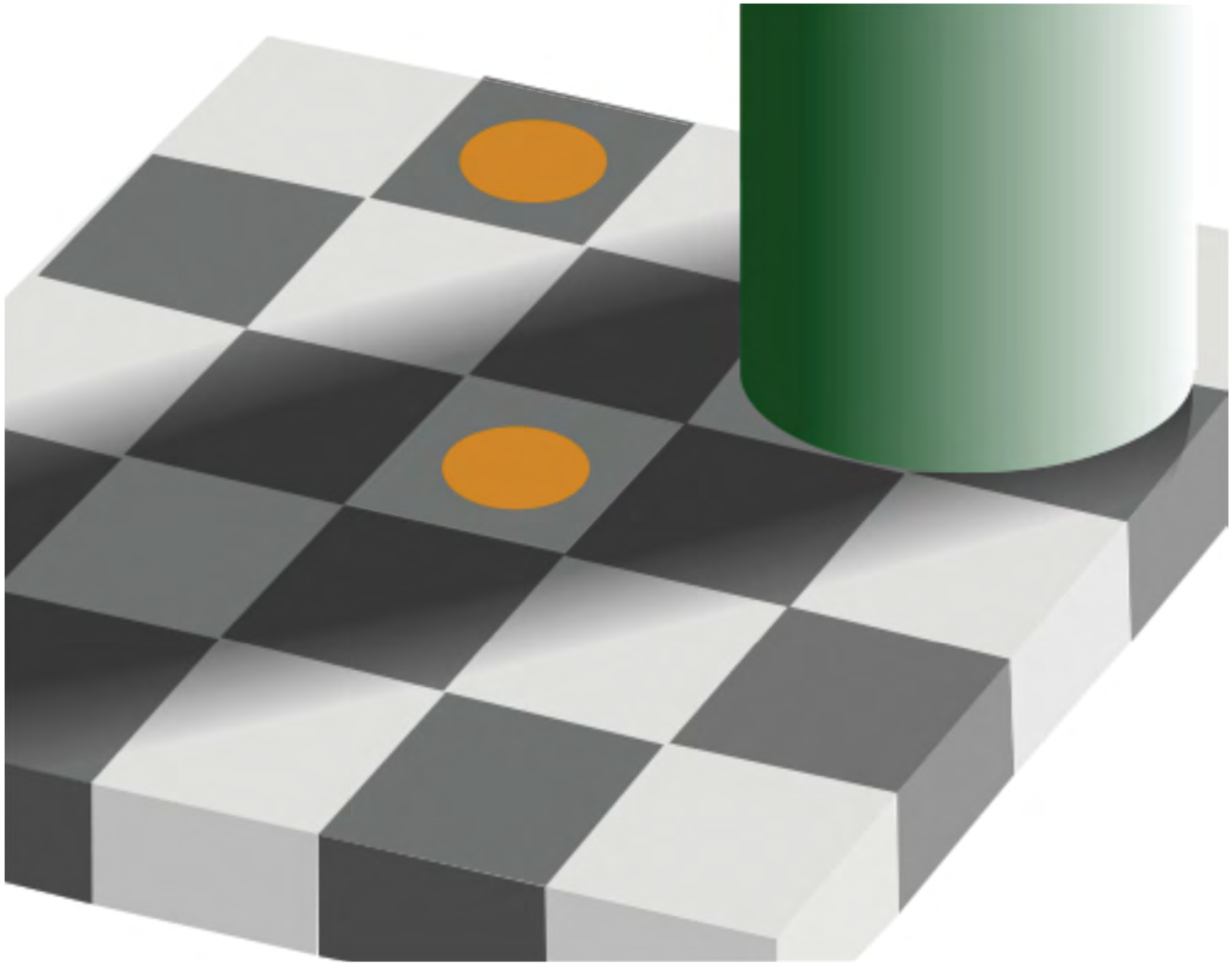
Murrell (2011) ***R Graphics, 2/e***

Few (2012) ***Show Me the Numbers***

The eye collects, the nerves transmit, and perception occurs in the brain.



Perception happens in your brain.



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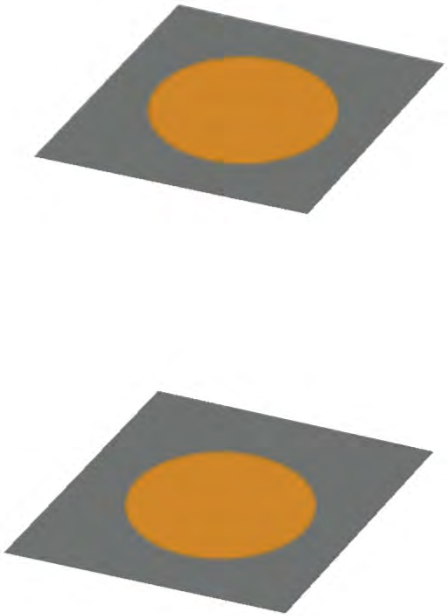
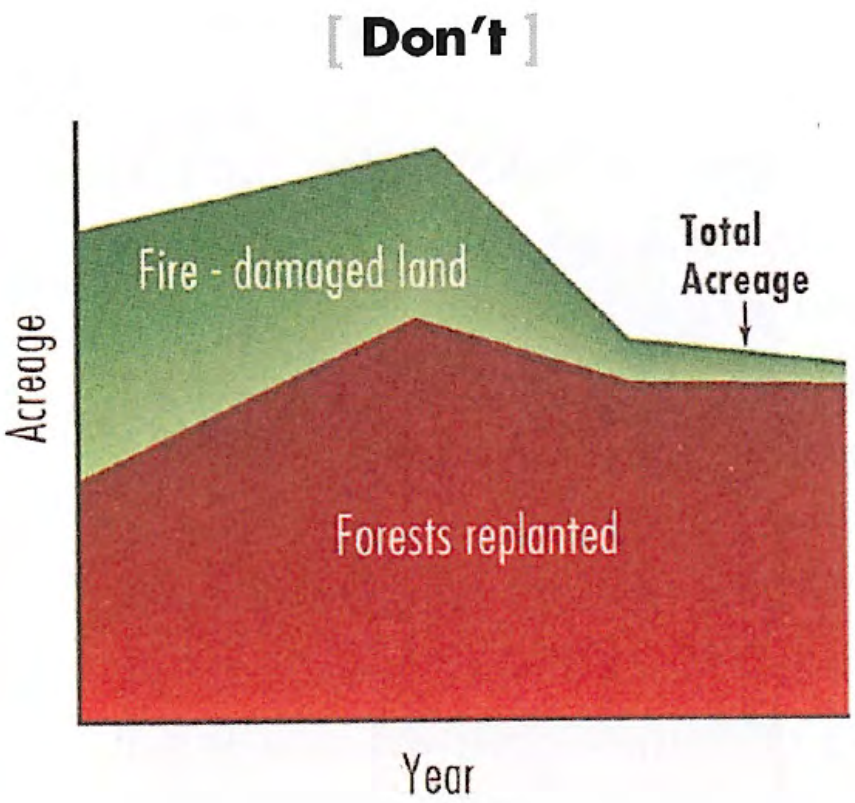
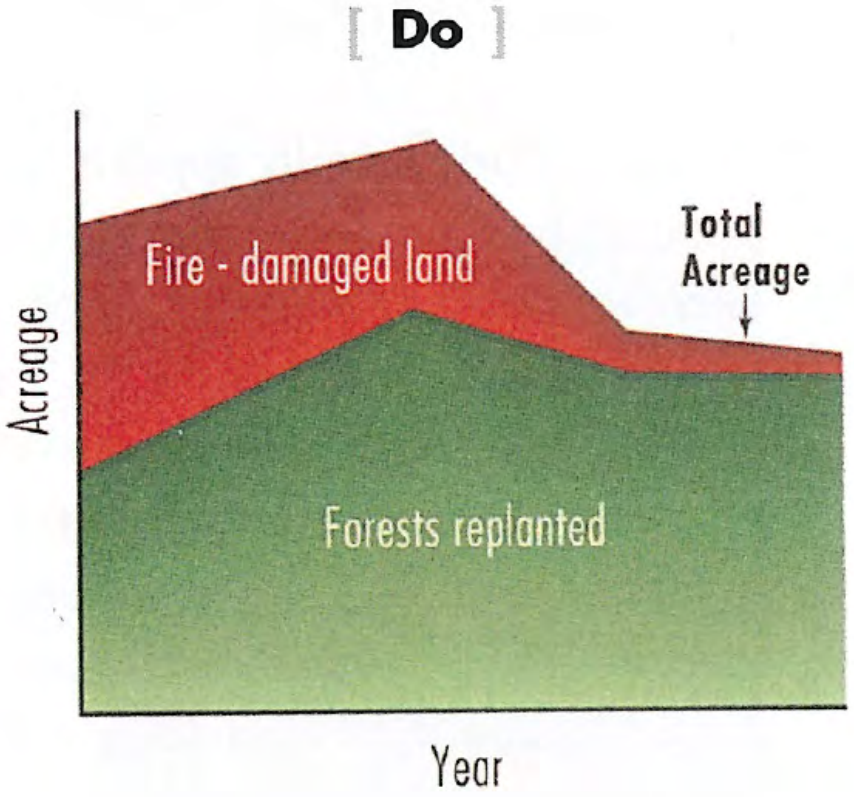


Perception happens in your brain.

Advice: be aware of the effects of surroundings elements.

Respect compatibility and conventions of color.





Kosslyn, p.163

Respect compatibility and conventions of color.

…but be aware of differences between cultures or subcultures.

For example, green means:

- “safe” for process engineers
- “infected” for health workers
- “profitable” for finance managers

Test your color choices with people who represent your audience.

Kosslyn, p.164

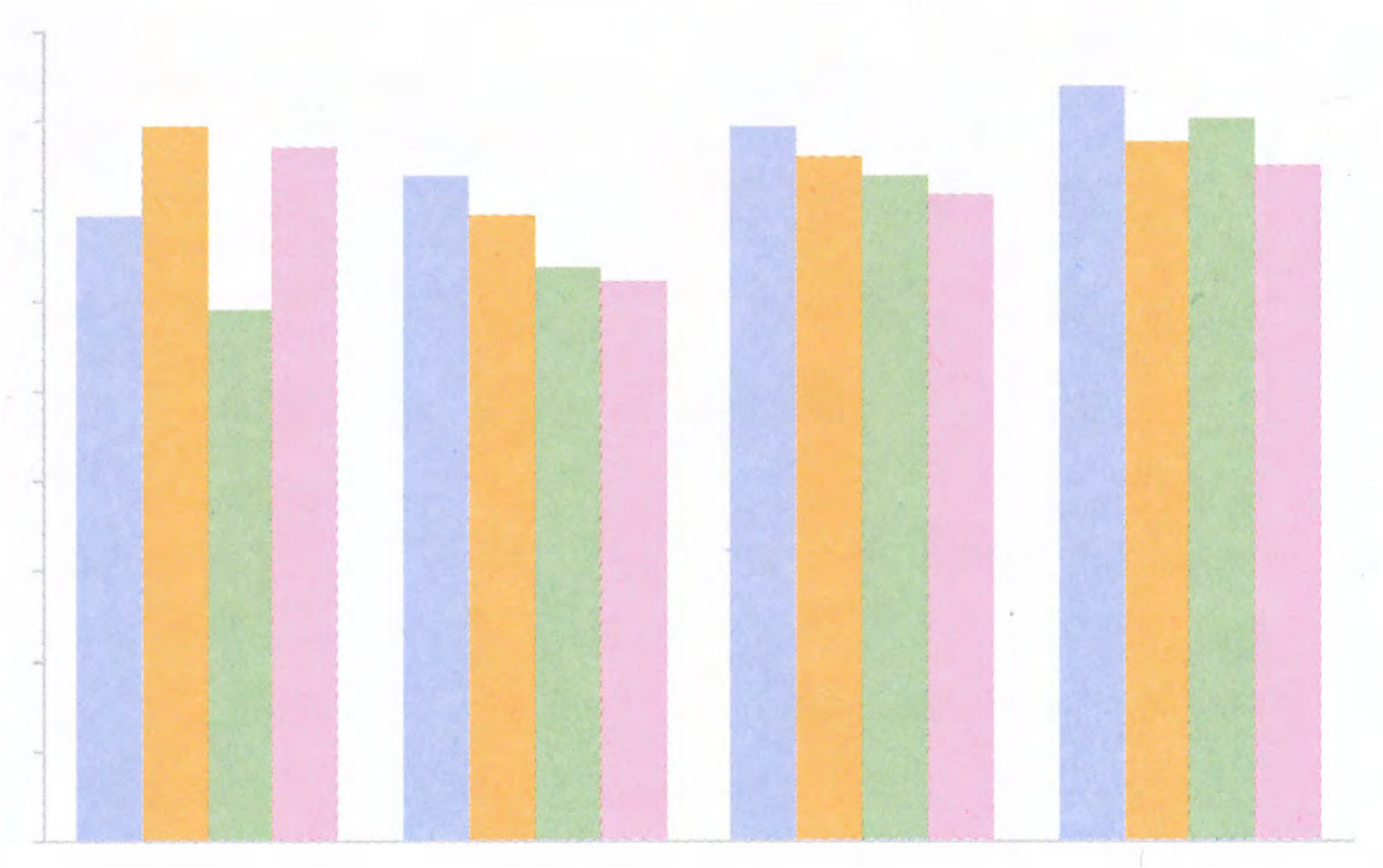
In the US, the concepts most often associated with red and blue are…

- trust
- security
- high quality
- high technology
- reliability/dependability

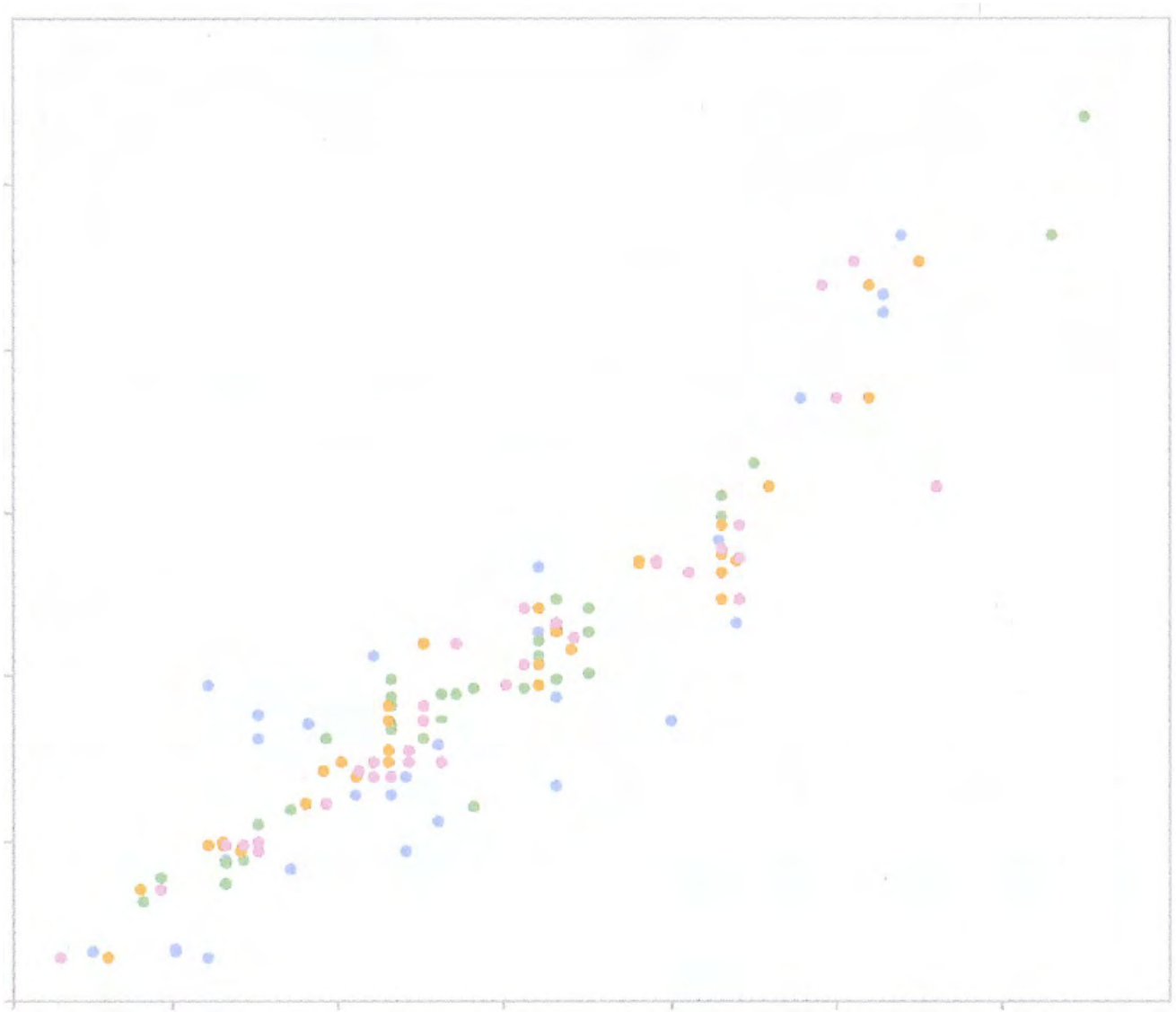
- speed
- cheap/inexpensive
- fear/terror
- fun

Kosslyn, p.164

A “light” palette allows us to easily distinguish bars…



… but a light palette does not help us distinguish small objects such as data points.



Use a medium palette for small data-encoding objects such as points and lines.

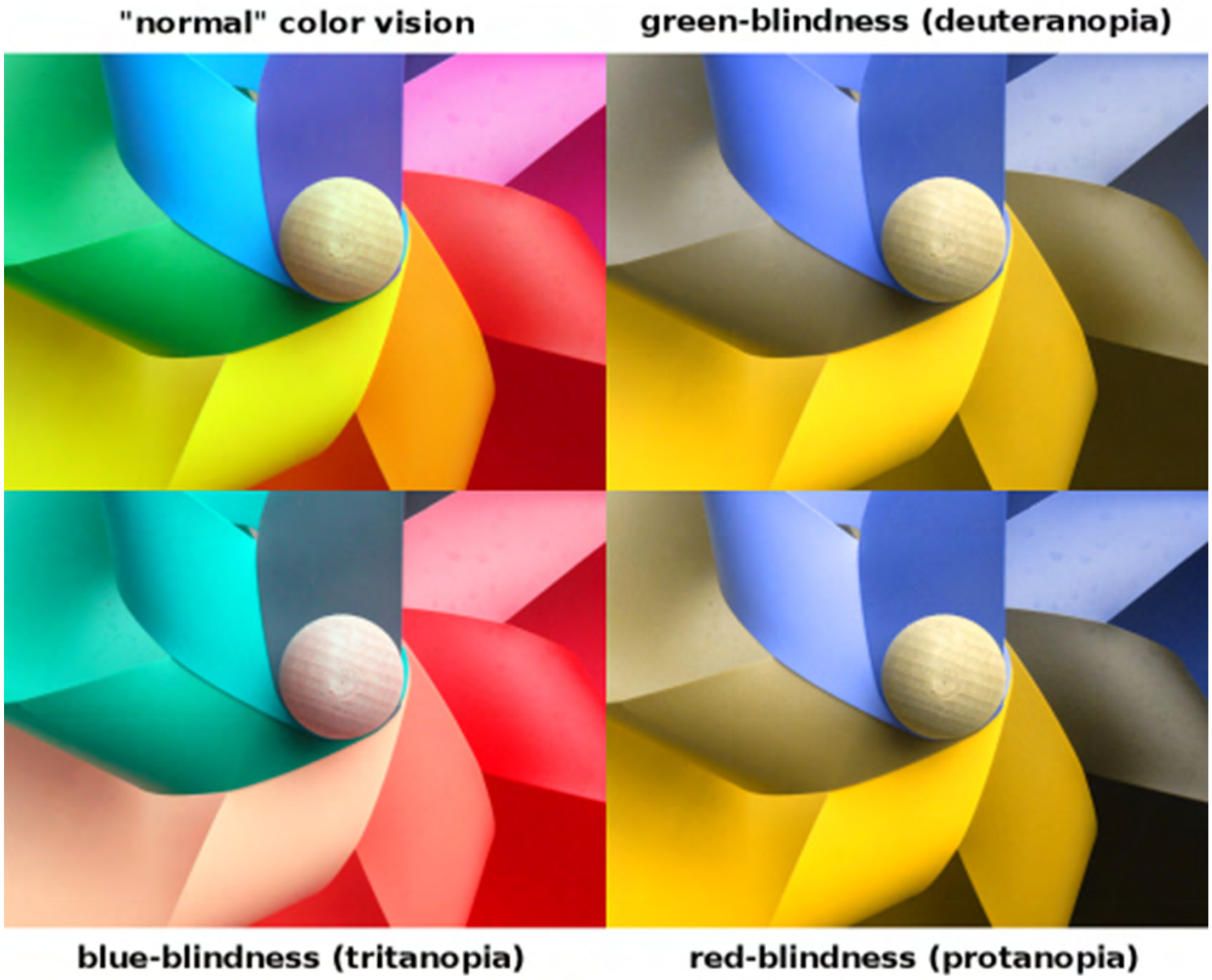
Medium

R	G	B
77	77	77
93	165	218
250	164	58
96	189	104
241	124	176
178	145	47
178	118	178
222	207	63
241	88	84

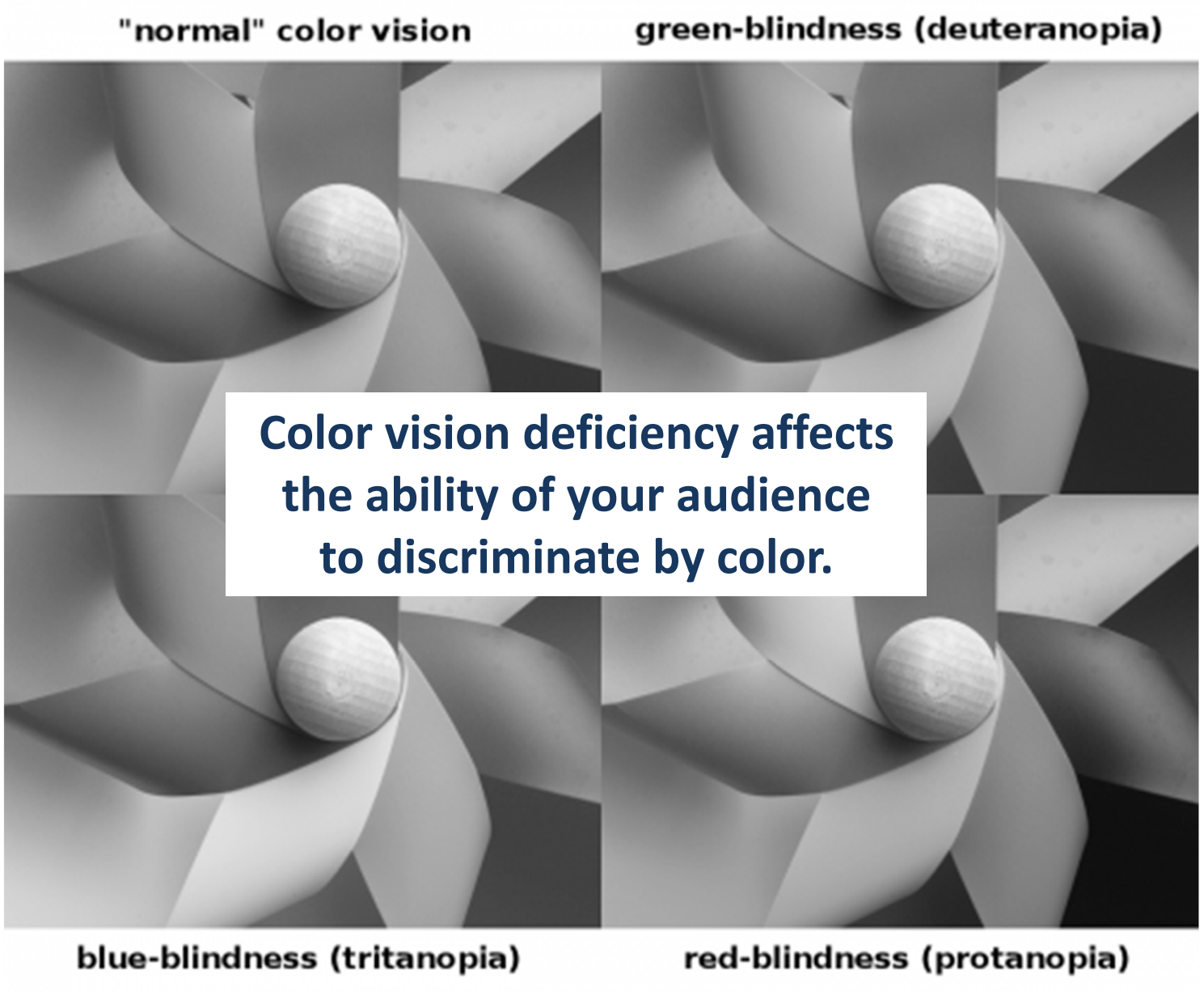
Use a dark palette to highlight a particular item.

R	G	B
0	0	0
38	93	171
223	92	36
5	151	72
229	18	111
157	114	42
123	58	150
199	180	46
203	32	39

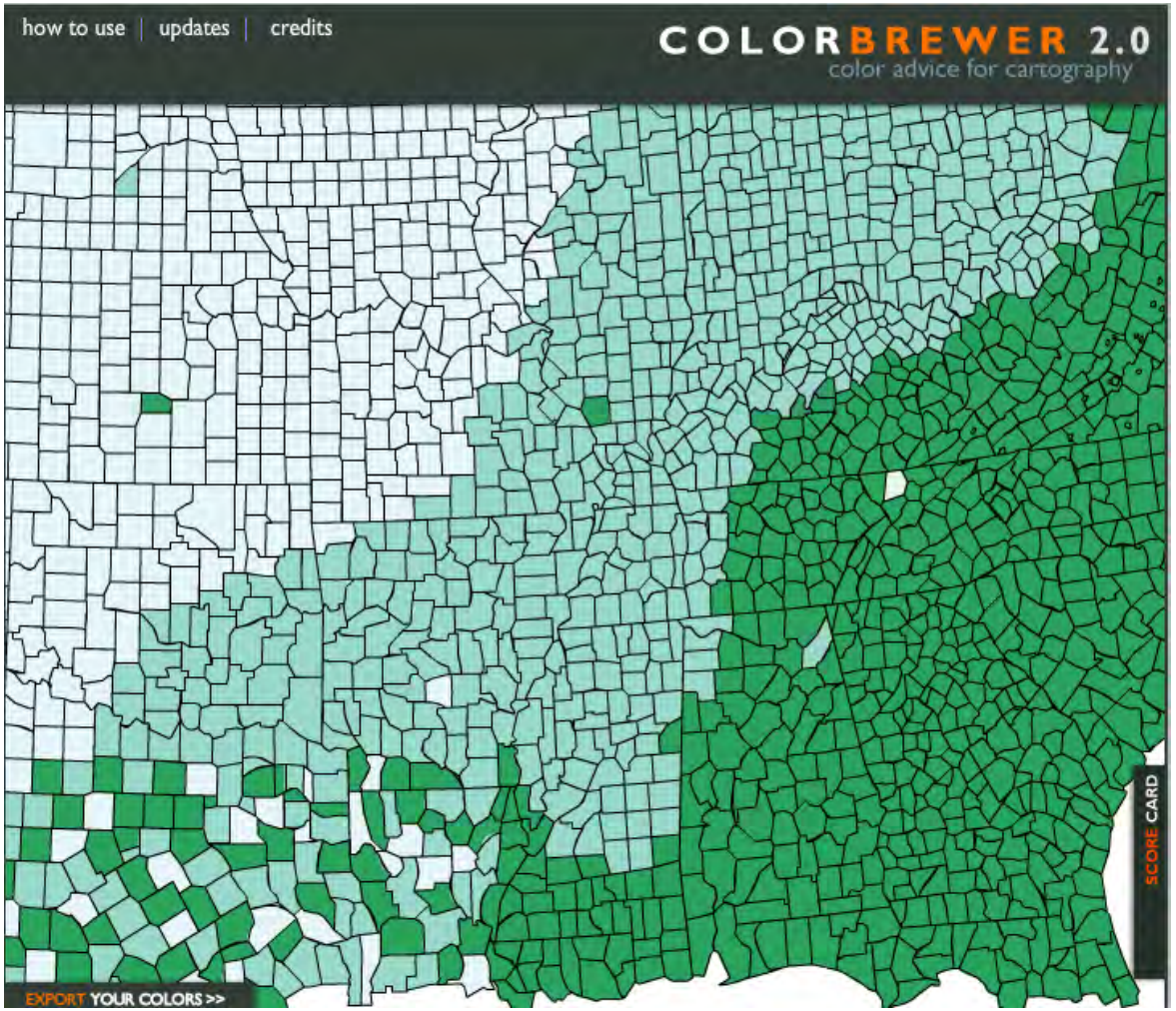
Perception – variation in discriminating color.



Perception – variation in discriminating color.



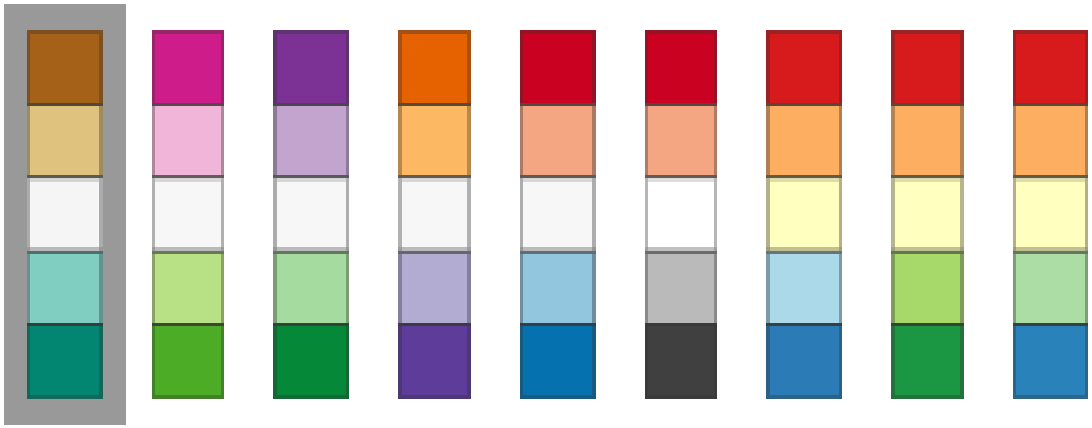
Selecting color palettes – use the Color Brewer website.



[Color Brewer]

diverging palette
sequential palette
color-vision-deficient safe
color IDs

Diverging palettes

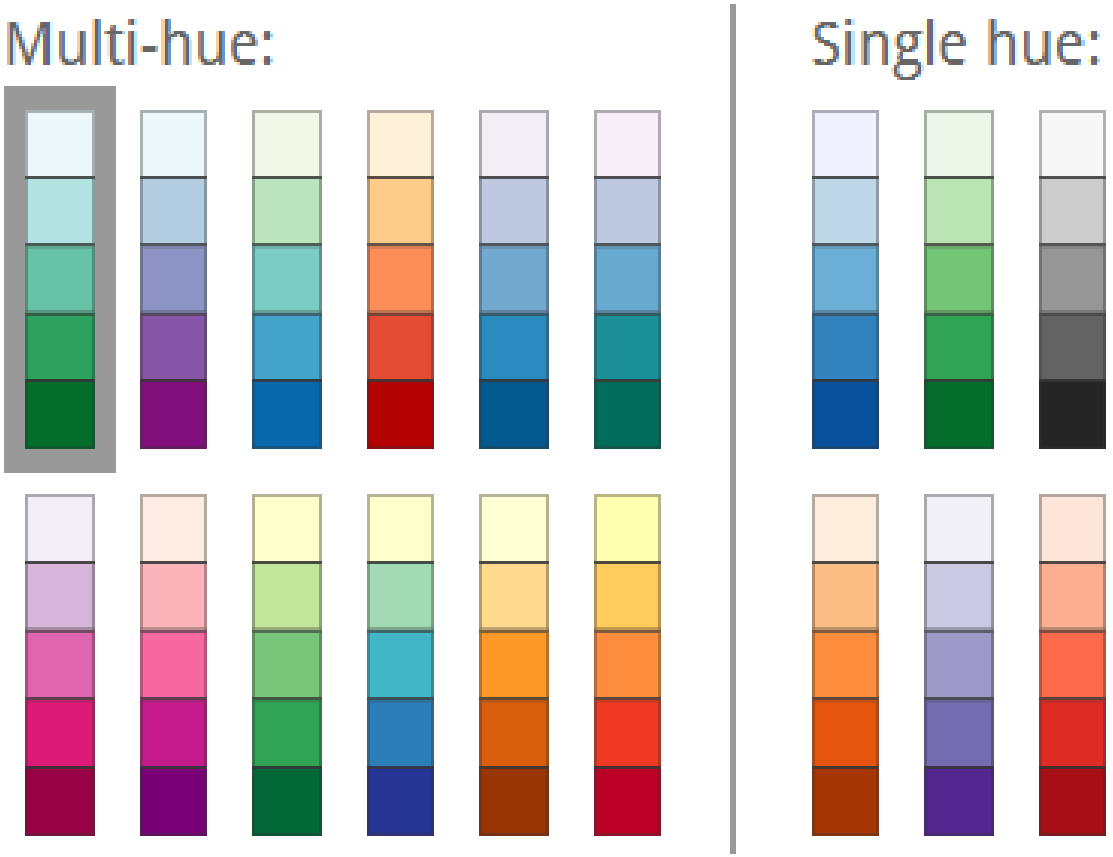


Palette names

BrBG	PiYG
PRGn	PuOr
RdBu	RdGy
RdYlBu	RdYlGn
Spectral	

[link to Color Brewer](#) website

Sequential palettes in RColorBrewer

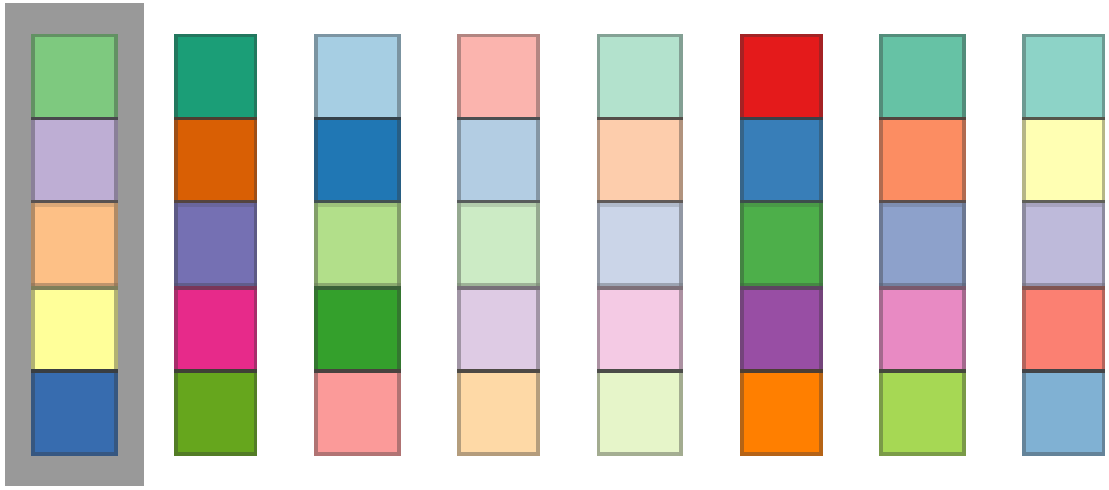


Palette names

Blues	BuGn
BuPu	GnBu
Greens	Greys
Oranges	OrRd
PuBu	PuBuGn
PuRd	Purples
RdPu	Reds
YlGn	YlGnBu
YlOrBr	YlOrRd

[link to Color Brewer](#) website

Qualitative palettes

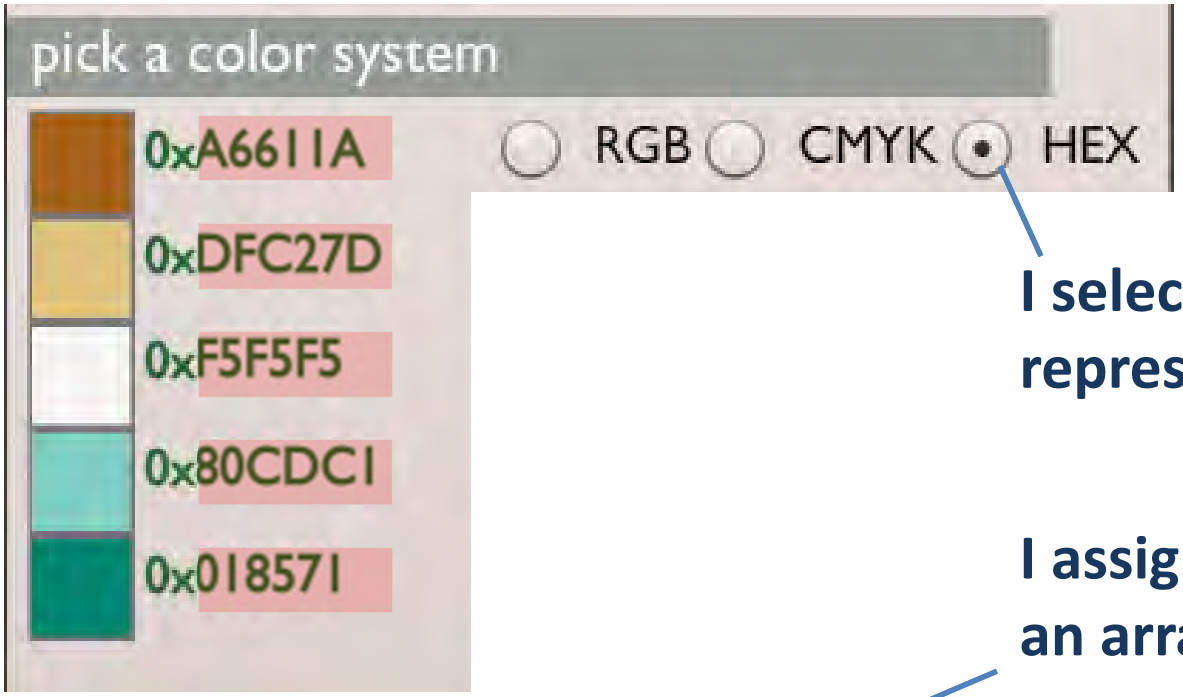


Palette names

Accent	Dark2
Paired	Pastel1
Pastel2	Set1
Set2	Set3

[link to Color Brewer](#) website

Selecting a divergent color series from the Color Brewer website.



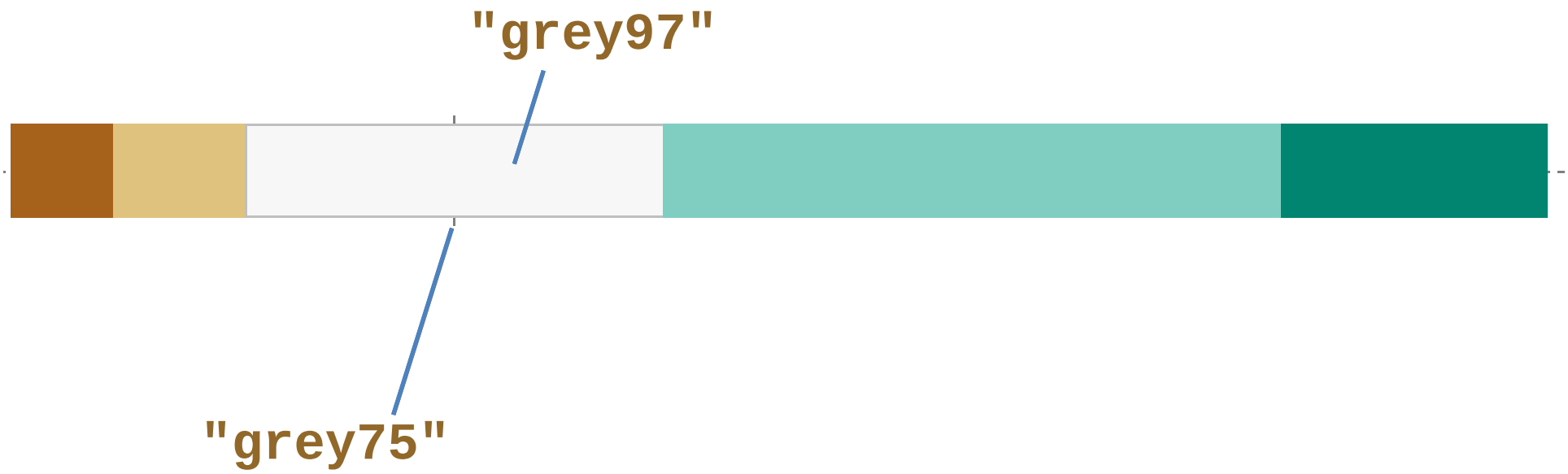
I selected the hexadecimal representation.

I assigned these colors to an array in R.

```
my_fill = c("#a6611a", "#dfc27d", "grey97",
            "#80cdc1", "#018571")
```

The border around the bars are the same hues except for the central gray border.

```
my_border = c("#a6611a", "#dfc27d", "grey75",
              "#80cdc1", "#018571")
```



The RColorBrewer package codes the colors for you.

```
library(RColorBrewer)

palette <- brewer.pal(5, "BrBG")
```

Creates a vector of color codes

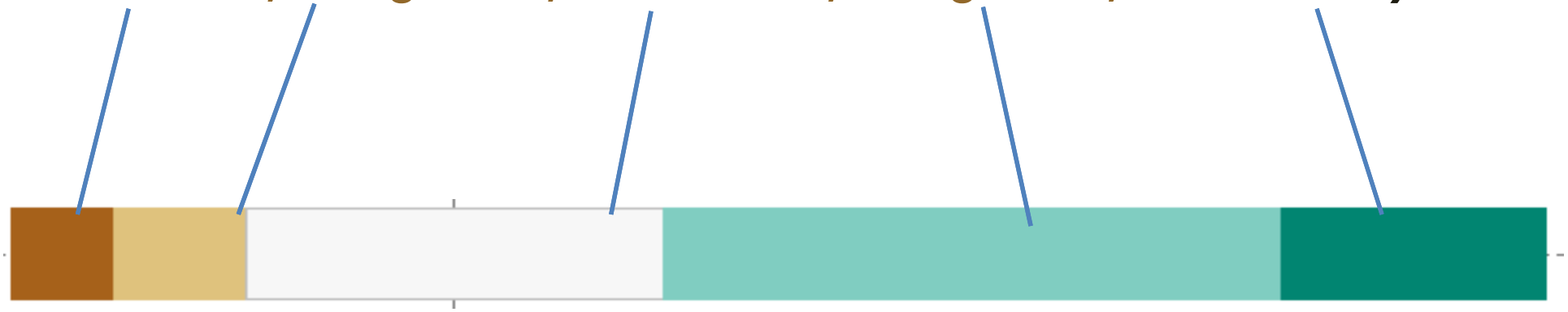
Number of colors

The RColorBrewer palette name

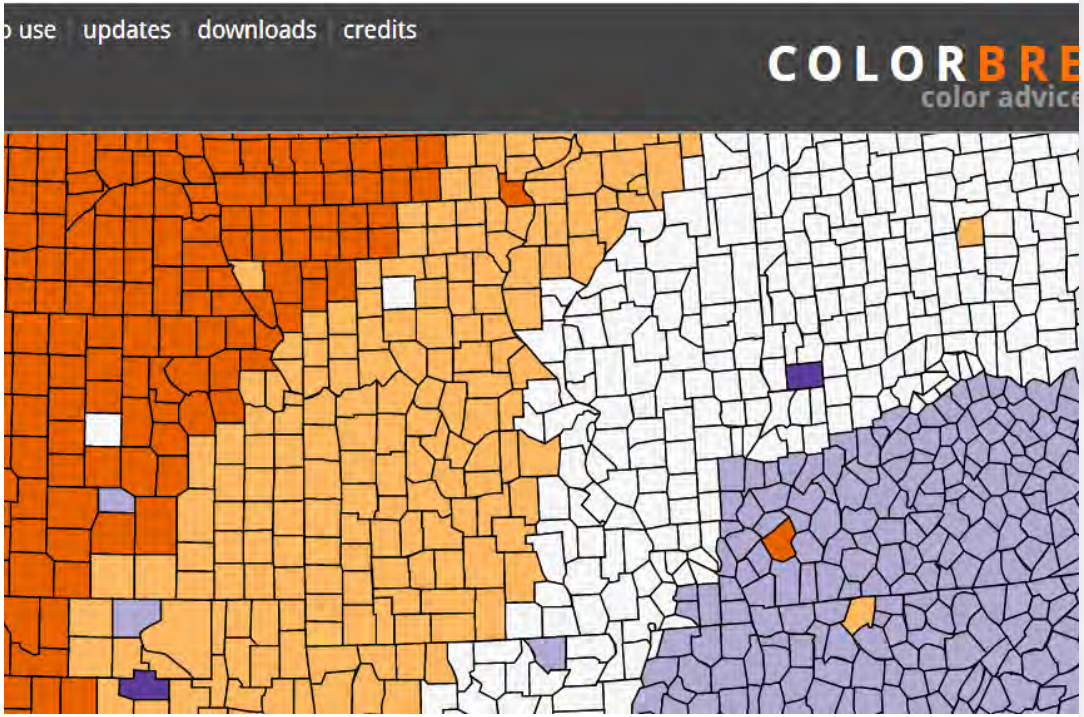
Producing a vector of hex color codes

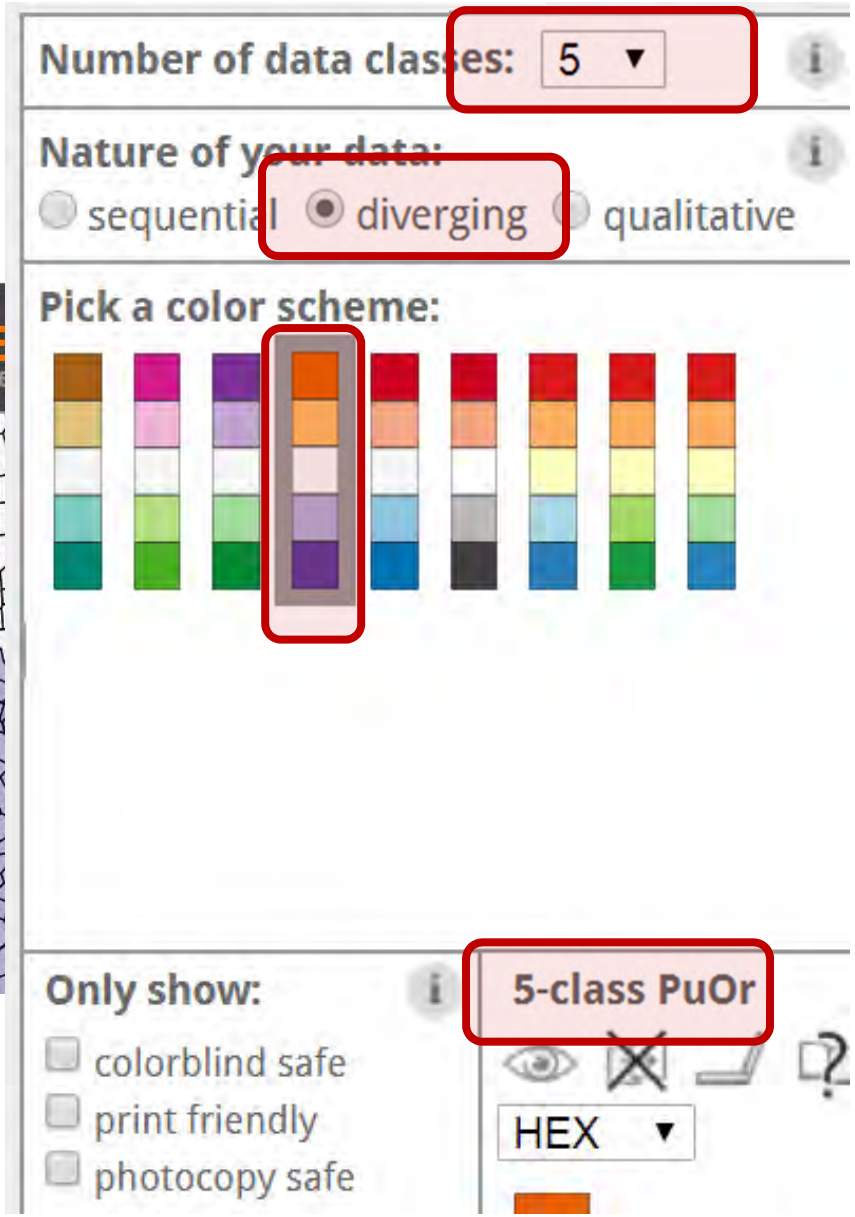
```
library(RColorBrewer)

palette <- brewer.pal(5, "BrBG")

darkBr  <- palette[1]
lightBr <- palette[2]
neutral <- palette[3]
lightBG <- palette[4]
darkBG  <- palette[5]
```

```
my_fill = c(
 darkBr, lightBr, neutral, lightBG, darkBG )
```



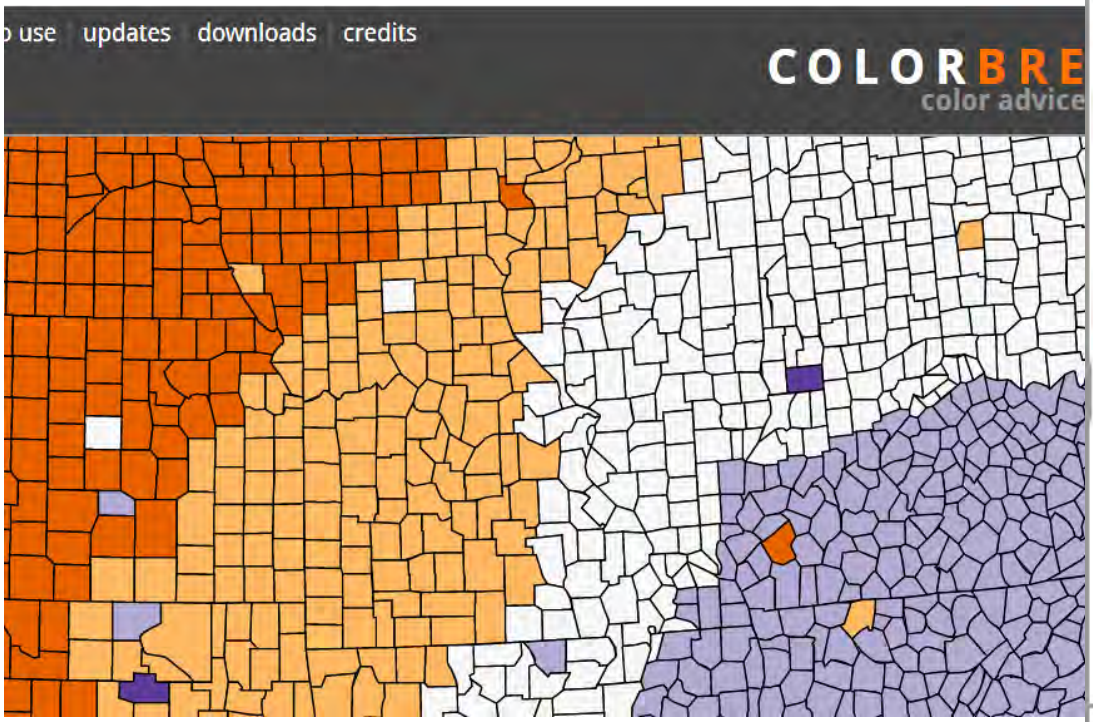
Fine tuning your palettes

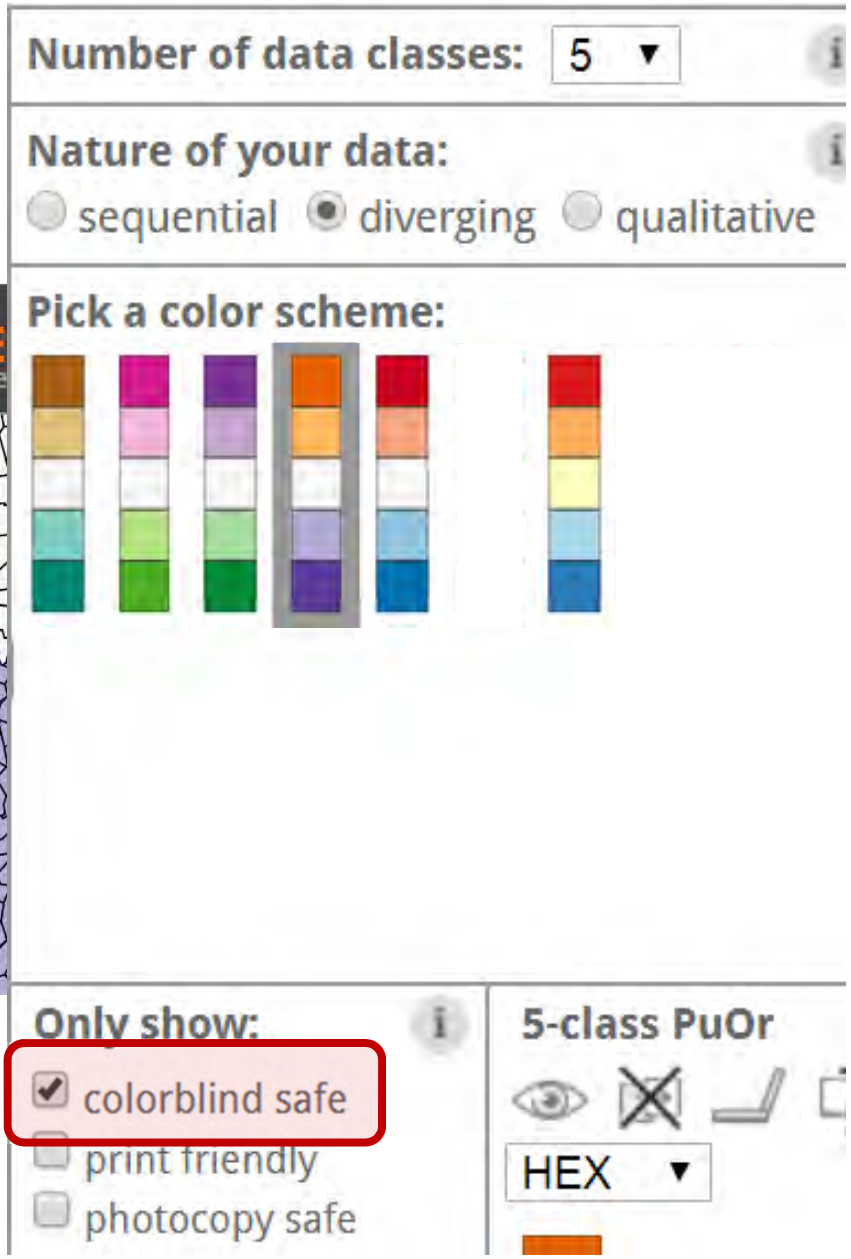




[link to Color Brewer](#) website

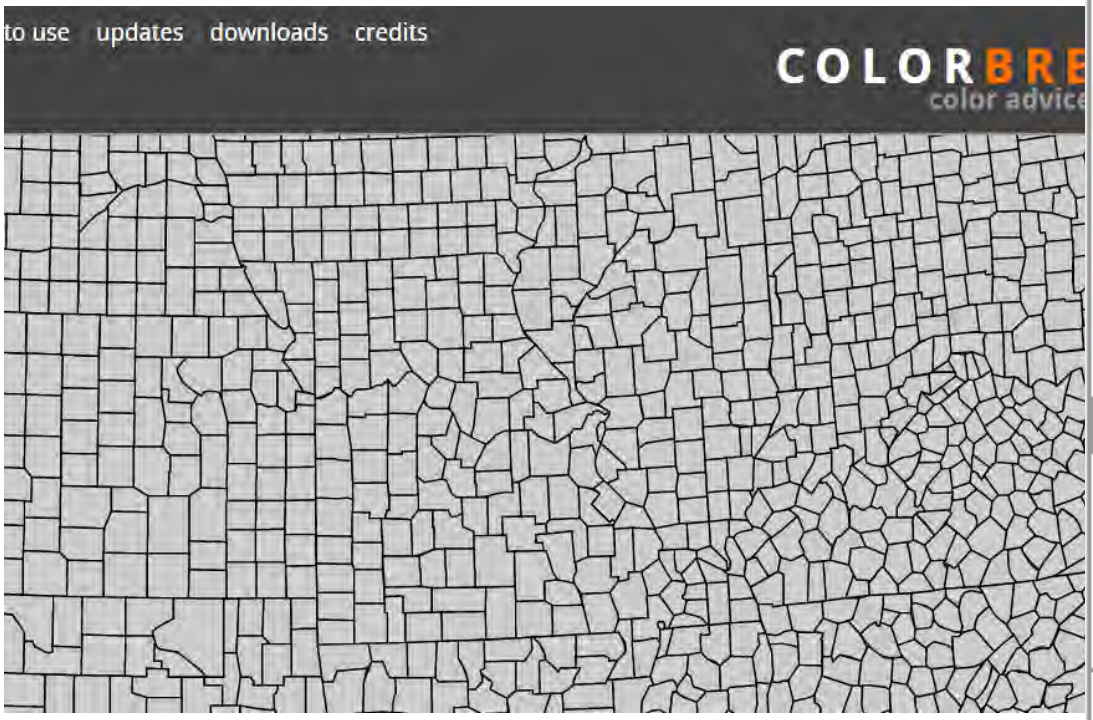
Fine tuning your palettes

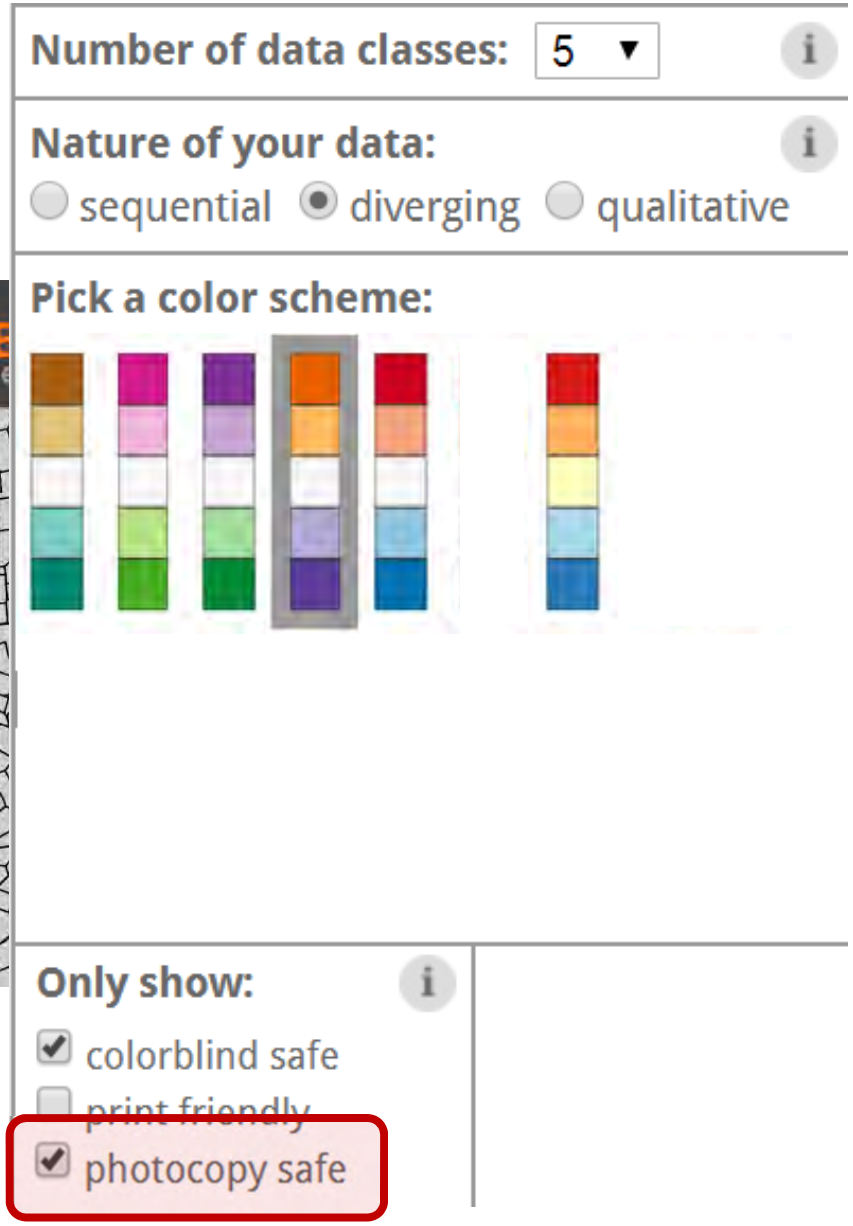




[link to Color Brewer](#) website

Fine tuning your palettes





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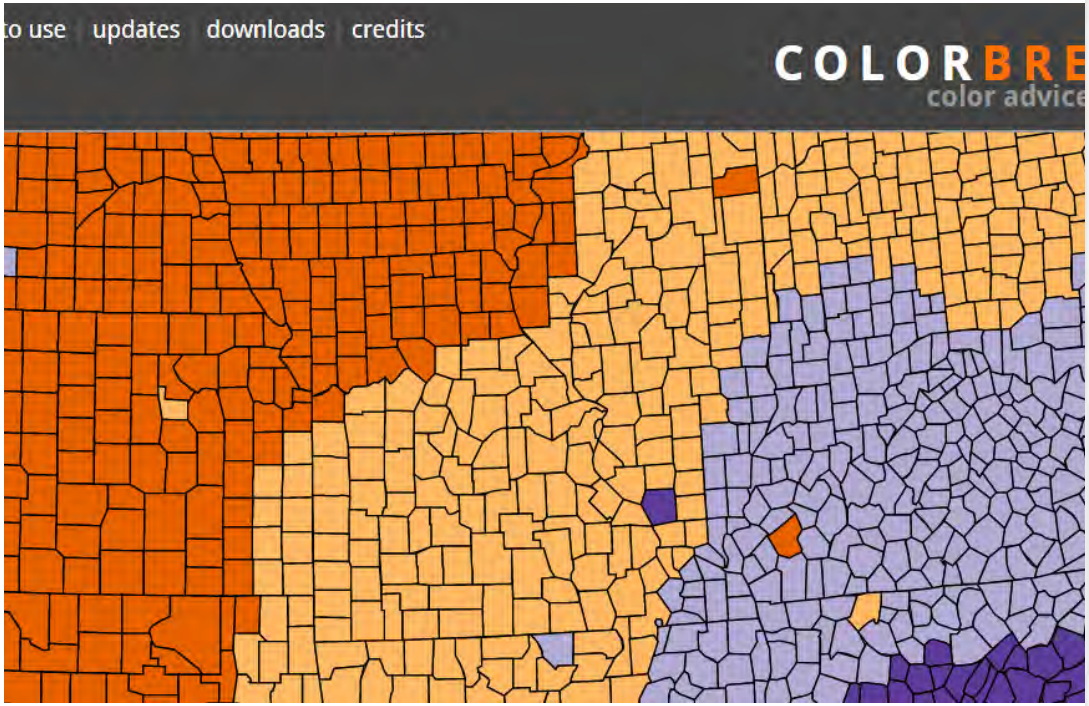
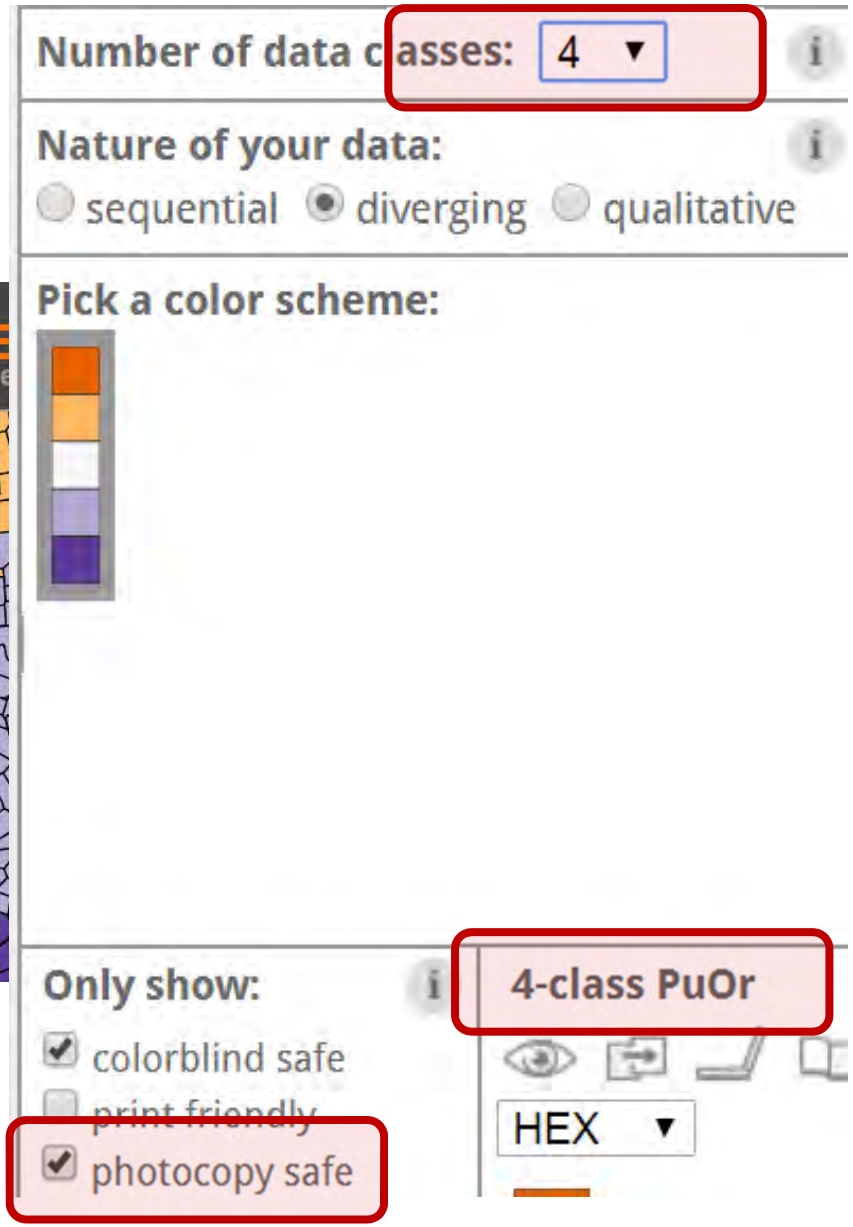




[link to Color Brewer](#) website

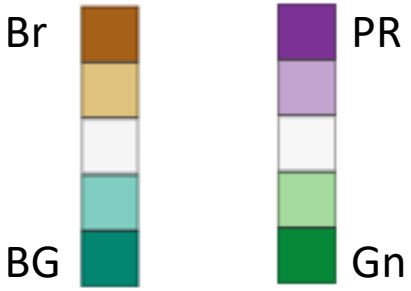
I've extracted some of the RColorBrewer palette in graphclassmate

```
library(graphclassmate)

color = rcb("dark_BG")
```

rcb() produces a
hex color code
from RColorBrewer

graphclassmate color name in quotes



form: "level_hue"
4 levels: dark, mid, light, pale
5 hues: Br, BG, PR, Gn, Gray