

Themes

Session 5

PMAP 8921: Data Visualization with R
Andrew Young School of Policy Studies
Fall 2023

Plan for today

CRAP and ggplot

The anatomy of a ggplot theme

CRAP and ggplot

Universal principles

Contrast

Repetition

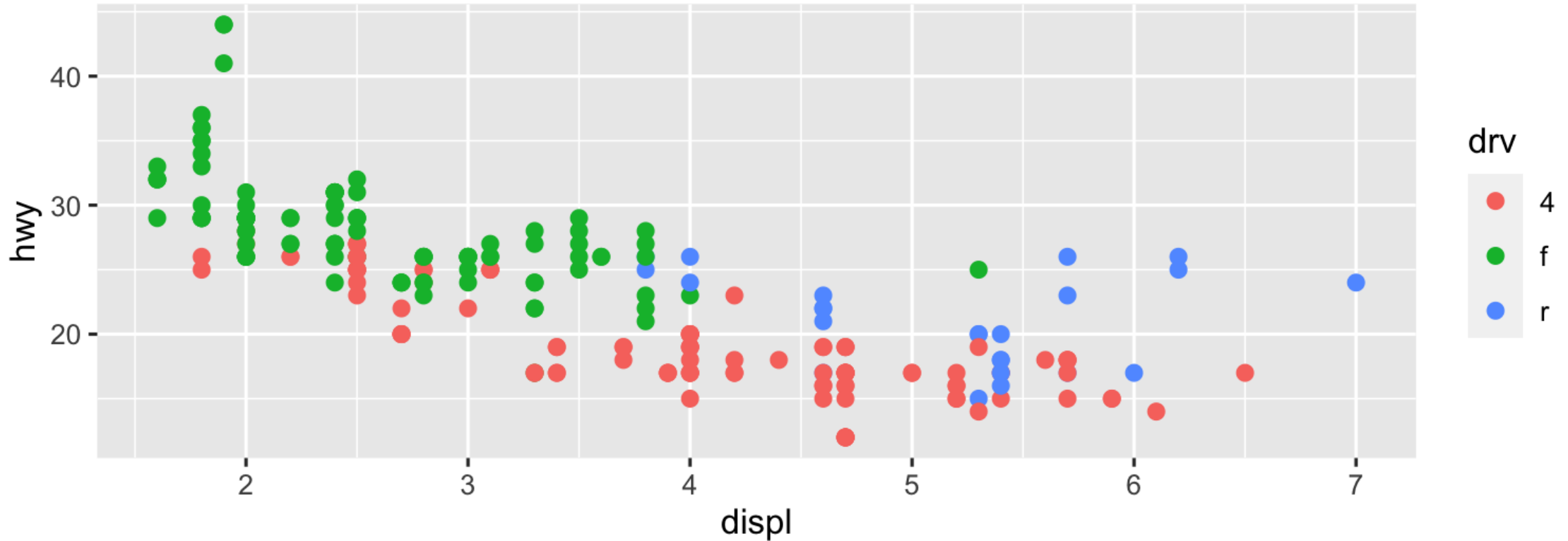
Alignment

Proximity

These design principles apply everywhere!

Graphic design, art, music, architecture... and graphs!

Is that gray background okay?



Applying CRAP to ggplot

We can follow CRAP principles to make big improvements to our plots

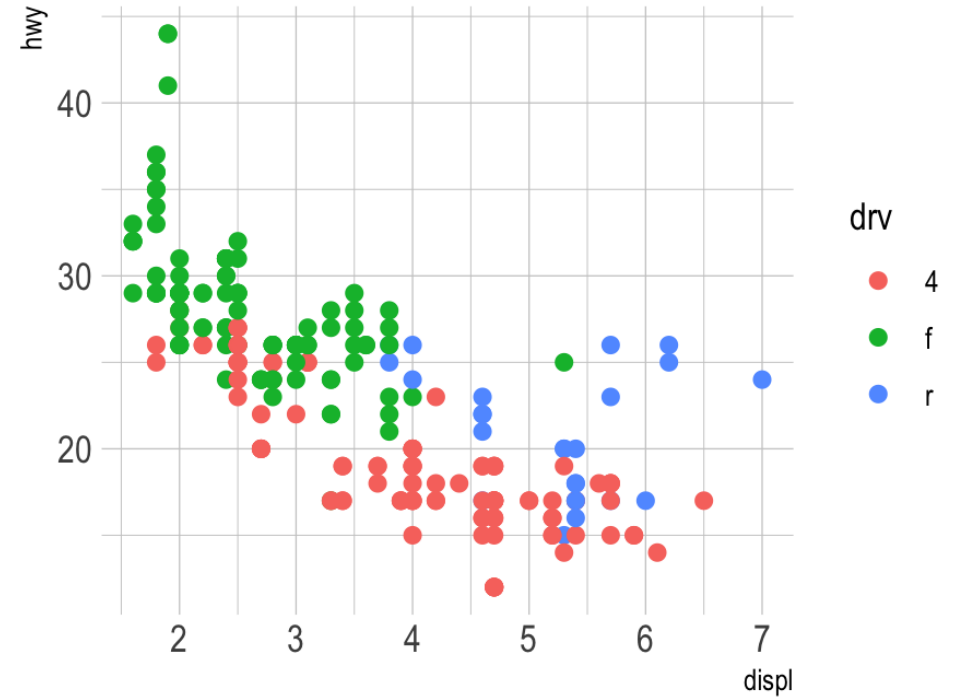
Claus Wilke's chapter covers lots of these graph-specific principles

We can apply these principles to ggplot plots

Like this!

```
library(hrbrthemes)

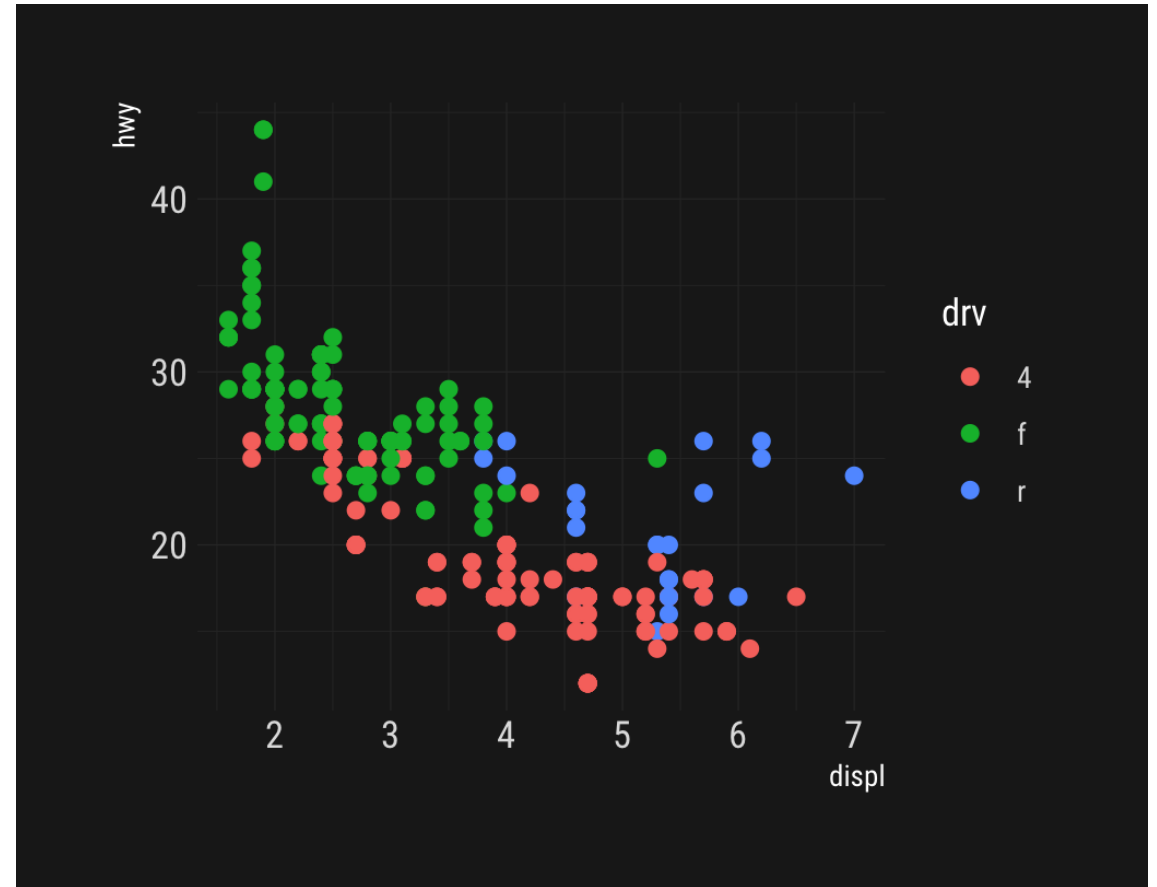
ggplot(mpg, aes(x = displ, y = hwy,
                color = drv)) +
  geom_point(size = 2) +
  theme_ipsum()
```



And this!

```
library(hrbrthemes)

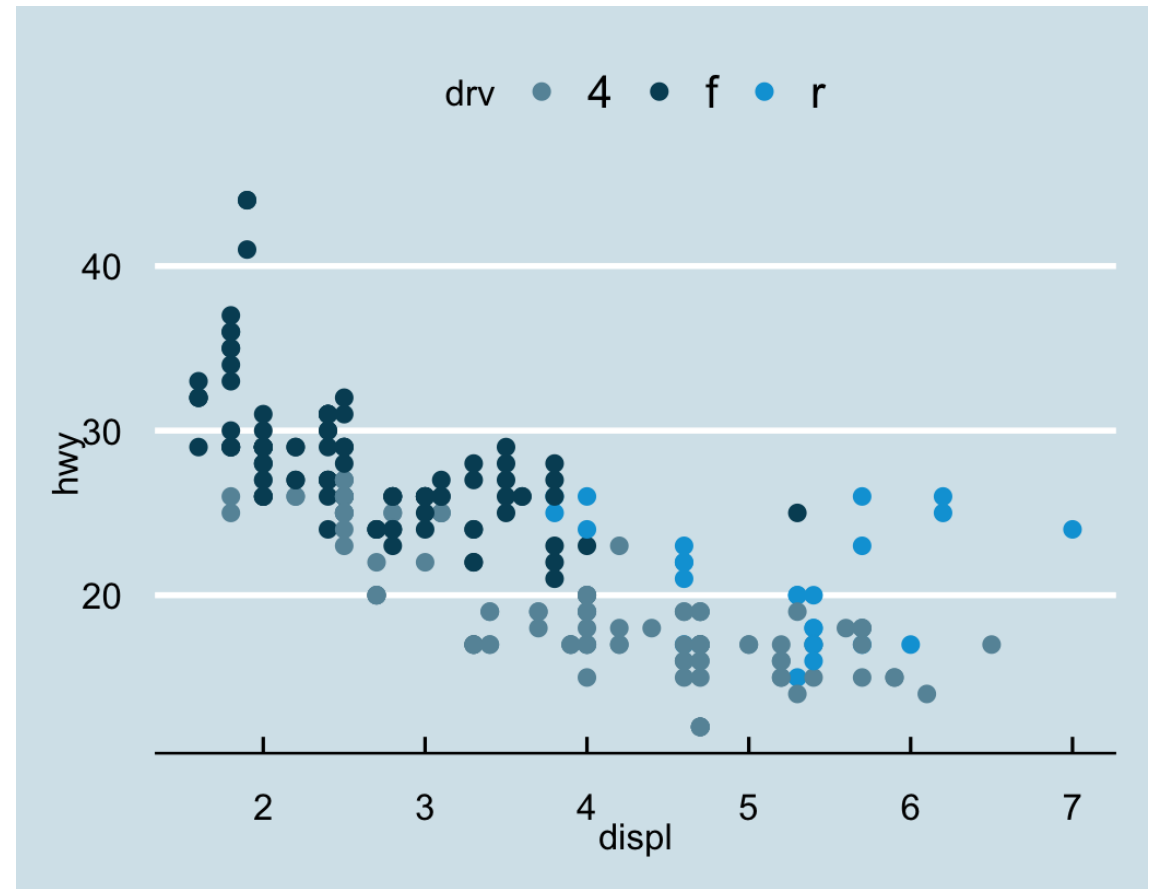
ggplot(mpg, aes(x = displ, y = hwy,
                color = drv)) +
  geom_point(size = 2) +
  theme_modern_rc()
```



Or this!

```
library(ggthemes)

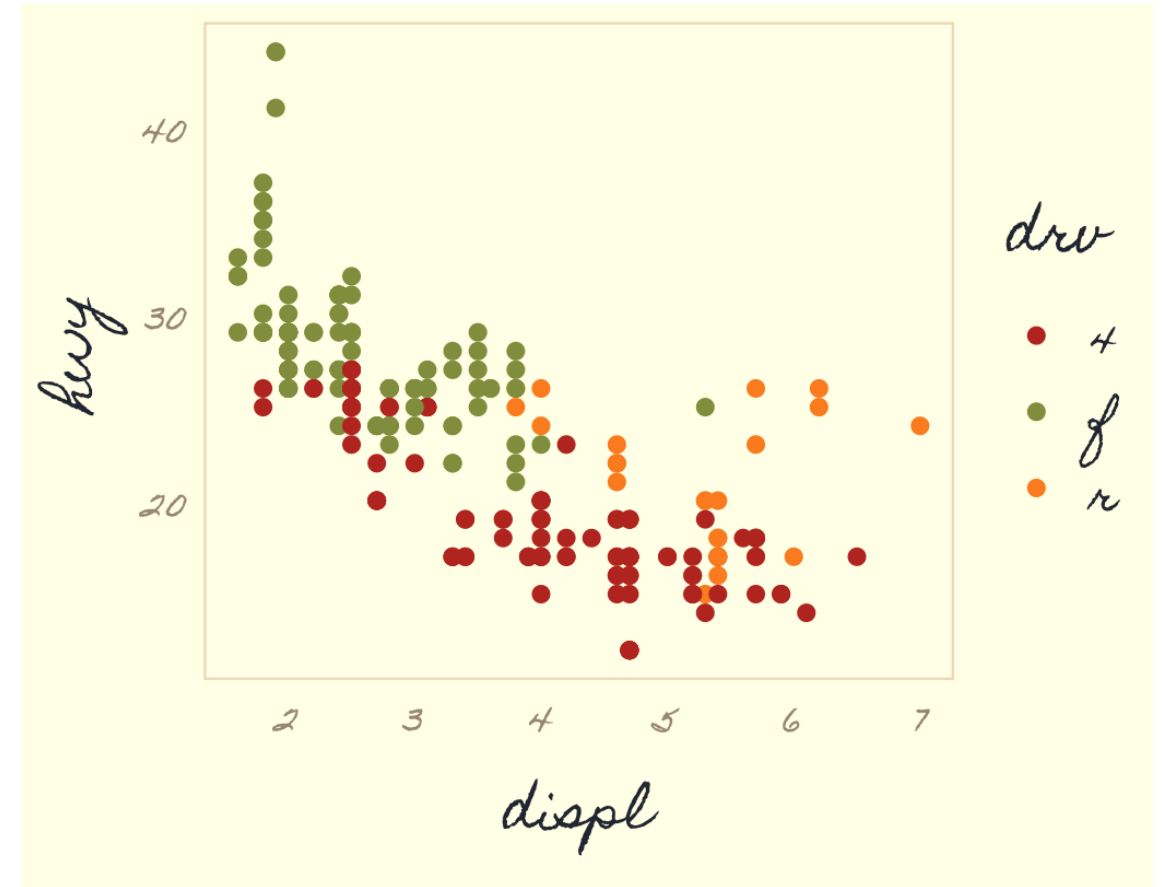
ggplot(mpg, aes(x = displ, y = hwy,
                color = drv)) +
  geom_point(size = 2) +
  scale_color_economist() +
  theme_economist()
```



And even this!

```
library(ggpomological)

ggplot(mpg, aes(x = displ, y = hwy,
               color = drv)) +
  geom_point(size = 2) +
  scale_color_pomological() +
  theme_pomological_fancy()
```



One magic, powerful function

theme()

The anatomy of a `ggplot()` theme

Theme system

ggplot2 Theme Elements

theme(element_name = element_function())

- element_text()
- element_line()
- element_rect()
- element_blank()

Axis elements:

- axis.ticks
element_line()
- axis.title
element_text()
- axis.text
element_text()
- axis.line
element_line()

Plot elements:

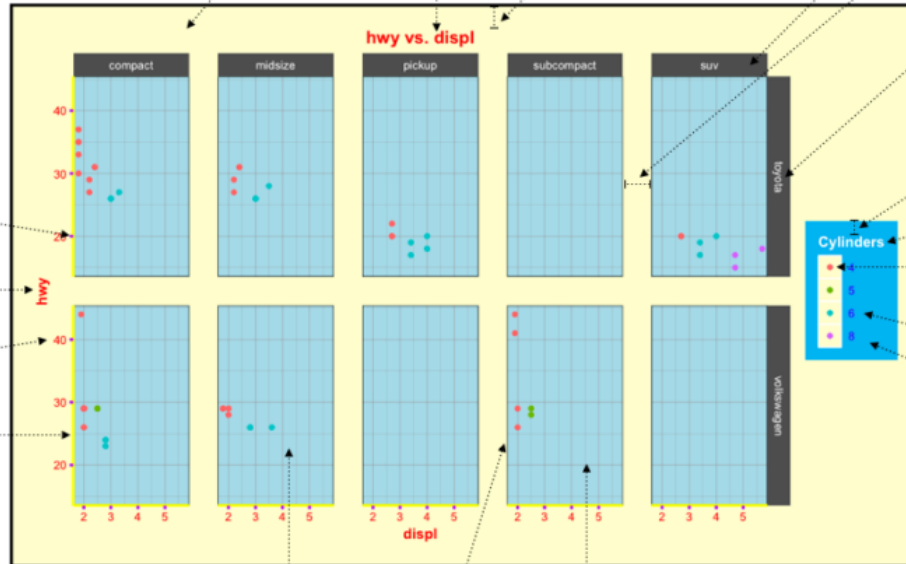
- plot.background
element_rect()
- plot.title
element_text()
- plot.margin
margin()

Facetting elements:

- strip.background
element_rect()
- panel.spacing
unit()
- strip.text
element_text()

Legend elements:

- legend.margin
margin()
- legend.title
element_text()
- legend.key
element_rect()
- legend.text
element_text()
- legend.background
element_rect()



- panel.background
element_rect()
- panel.border
element_rect(fill = NA)
- panel.grid
element_line()

Panel elements:

henrywang.nl

Derived from "ggplot2: Elegant Graphics for Data Analysis"

Theme elements

Each element in the plot can be targeted

Plot title = `plot.title`

Grid lines = `panel.grid`

Legend background = `legend.background`

Theme functions

Use special functions to
manipulate specific elements

Text-based things = `element_text()`

Rectangular things (backgrounds) = `element_rect()`

Line-based things (axis lines, grid lines) = `element_line()`

Disable element completely = `element_blank()`

How to learn theme()

The theme() function has **94 possible arguments(!!!)**

You can get hyper-specific with things like
`axis.ticks.length.x.bottom`

The only way to learn how to use theme() is to use it and tinker with it

How to learn theme()

I cannot show you everything

That's why we have the lesson, example, and exercise!