

# Daten sichtbar machen

## Visualisierung mit R

Maierbrugger

# ORGANISATION

# Software Anforderungen

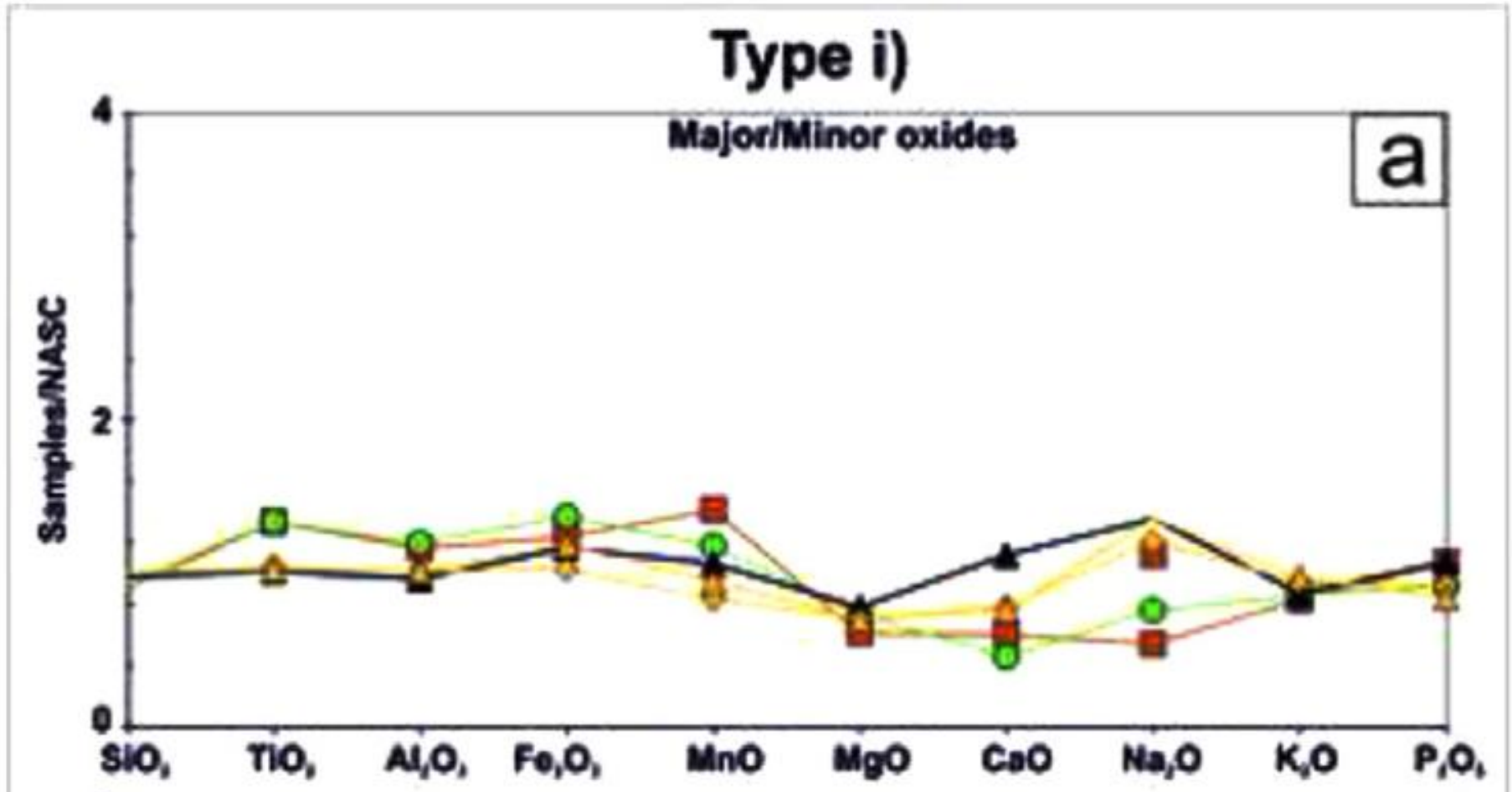
- R
  - <https://cran.rstudio.com/>
- RStudio
  - <https://cran.rstudio.com/>

R 😊



# Plan for the day 😊

- Visualisierung - Dos and Don'ts
- Mini Einführung in R
- Statische Visualisierungen
- PAUSE
- Animierte Visualisierungen
- Hands-On
  - Gegebene Grafik verbessern
  - (Eigene) Daten visualisieren



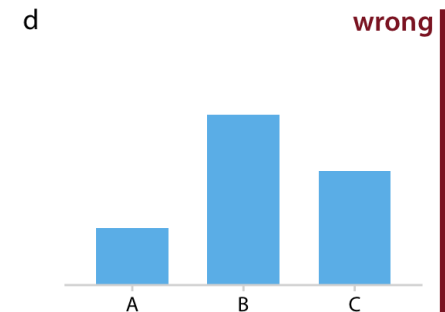
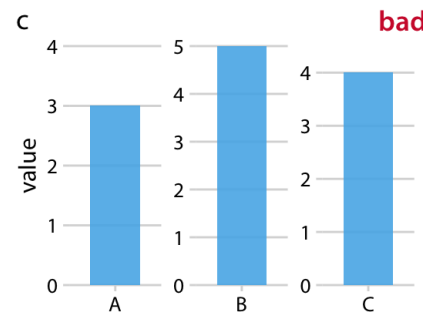
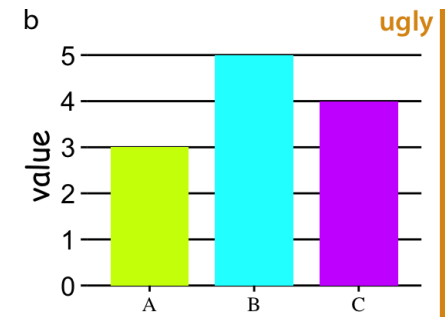
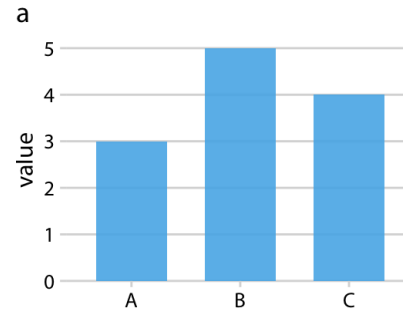
# VISUALISIERUNG - DOS AND DON'TS

Inhalte entnommen aus:

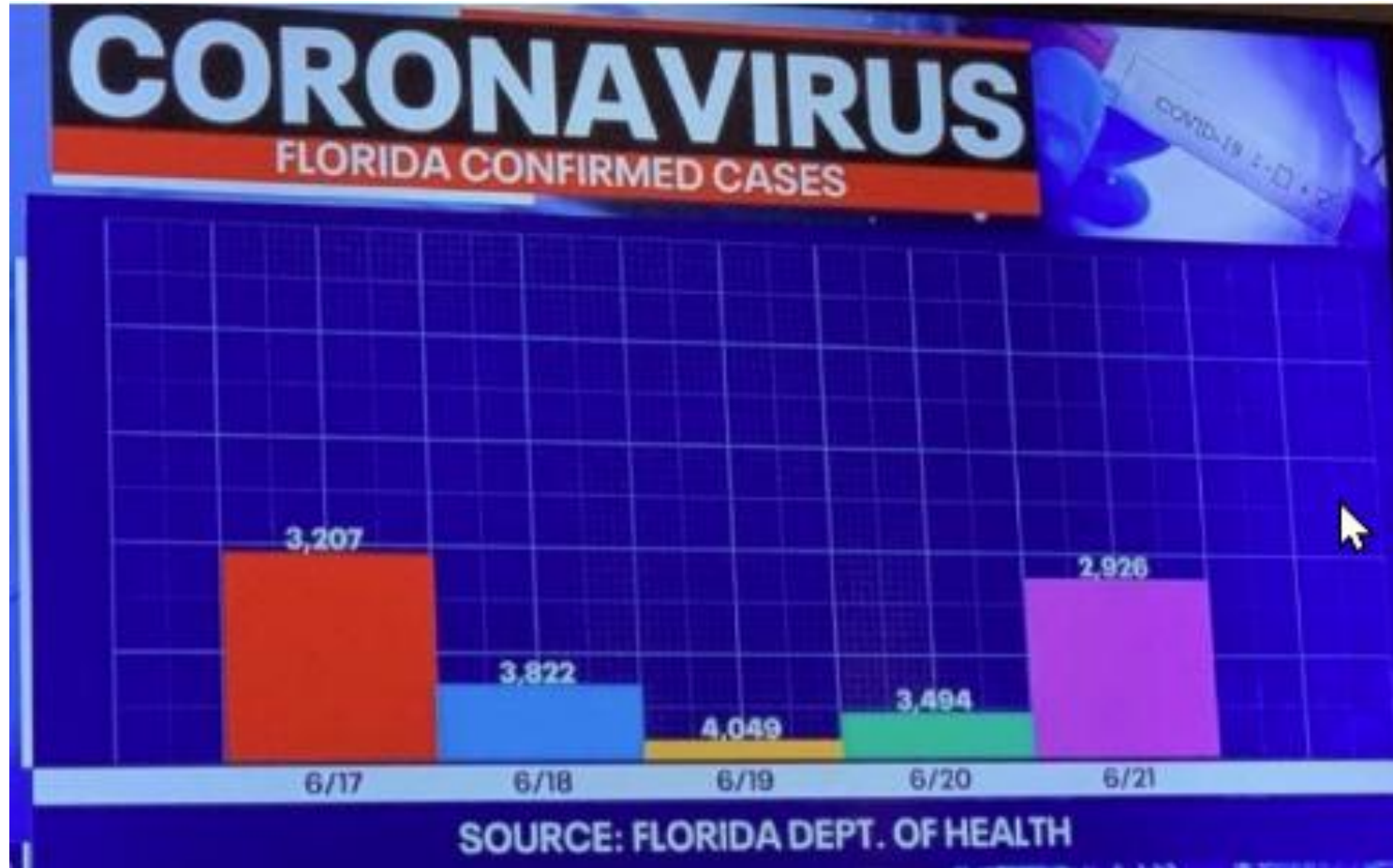
Michael Melcher, Vorlesungsunterlagen „Fortgeschrittene Informationsvisualisierung“, SS24

# Kategorien von „problematischen Plots“

- **Ugly:** (schwere) ästhetische Probleme, ansonsten klar und informativ
- **Bad:** Probleme bei der Auffassung der Abbildung, z.B. unklar, verwirrend, zu kompliziert, irreführend
- **Wrong:** Mathematische Probleme, objektiv inkorrekt



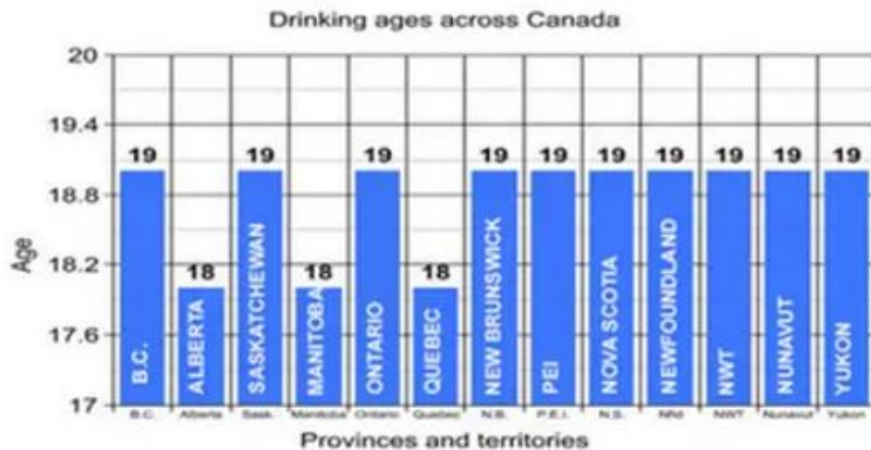
# Negativbeispiele - Skala



# Negativbeispiele - Story

## Drinking age will remain 19 in Saskatchewan

CBC News Posted: Mar 4, 2013 11:59 AM CST | Last Updated: Mar 4, 2013 11:55 AM CST 25



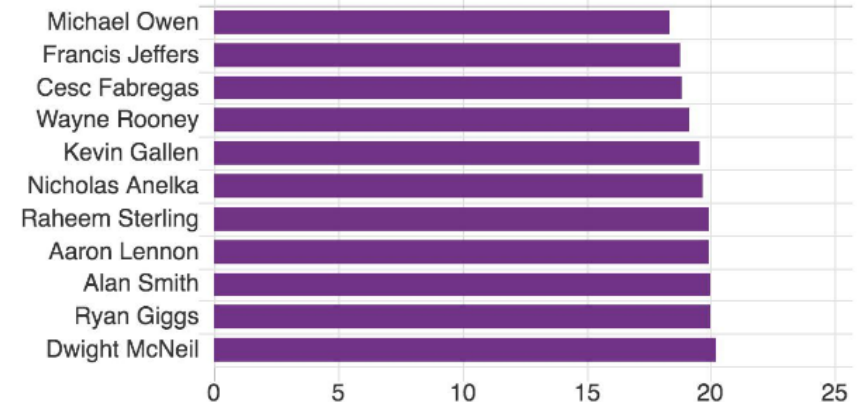
Canadian Centre on Substance Abuse

You have to be 19 in Saskatchewan to have a drink, while in Alberta and Manitoba, the drinking age is 18. (CBC)

The Saskatchewan Party government has ruled out lowering the drinking age, four months after party members put the issue in the public eye.

## Youngest players to 10 Premier League assists

Age



Opta

BBC

# Negativbeispiele – unnötig kompliziert



Percentage rokers in Nederland volgens het CBS

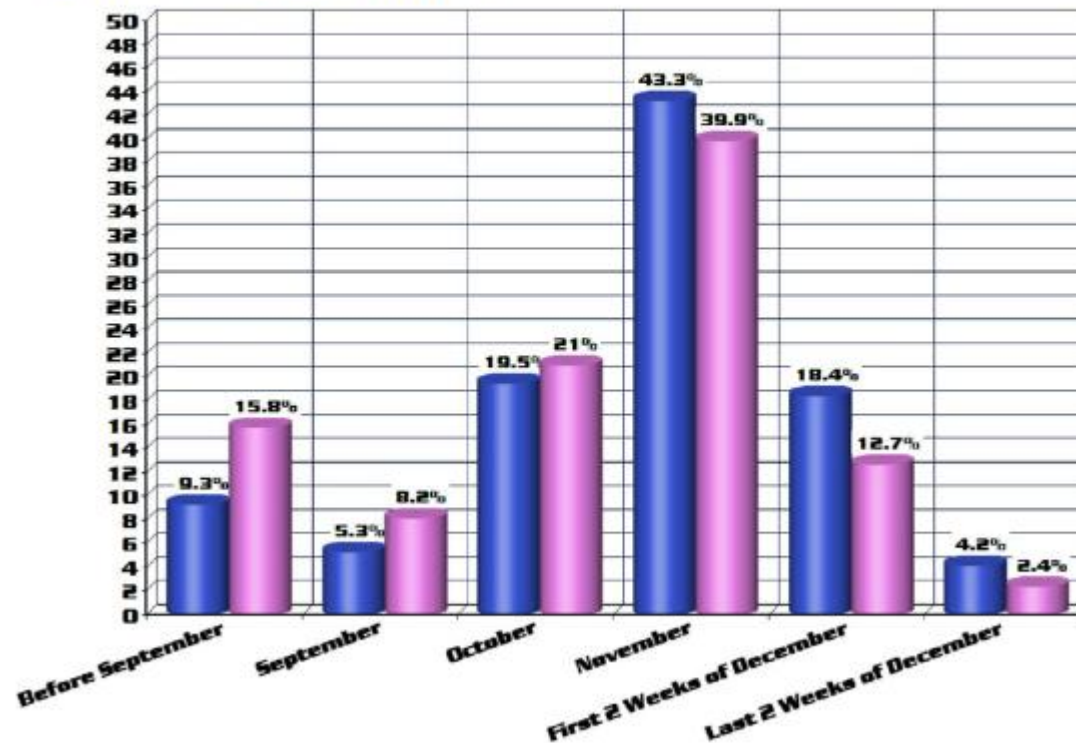
# Negativbeispiele - verwirrend



# Negativbeispiele – unnötiges 3D

## Shoppers Begins Shopping for Holidays

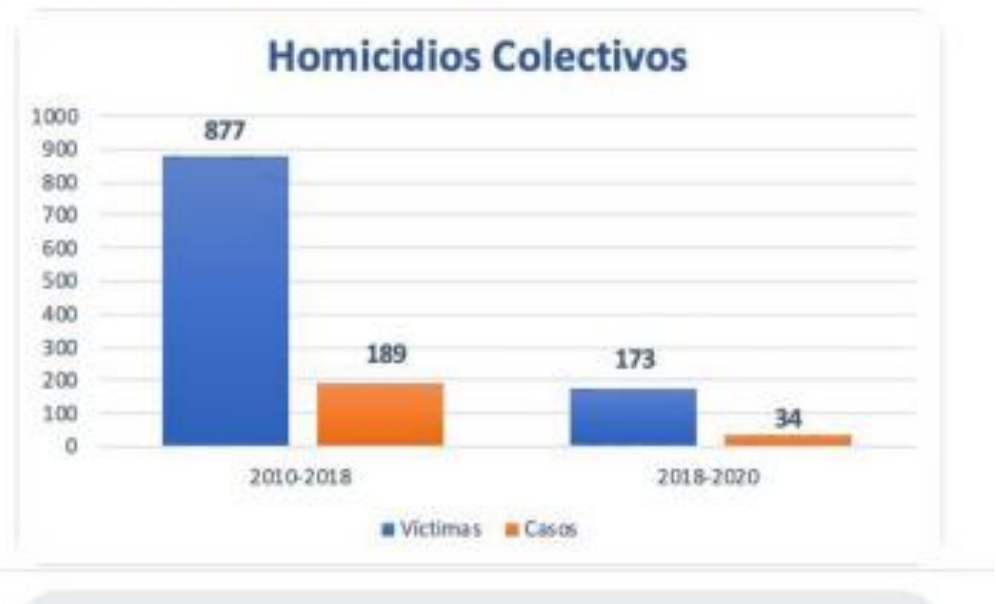
● Men ● Women



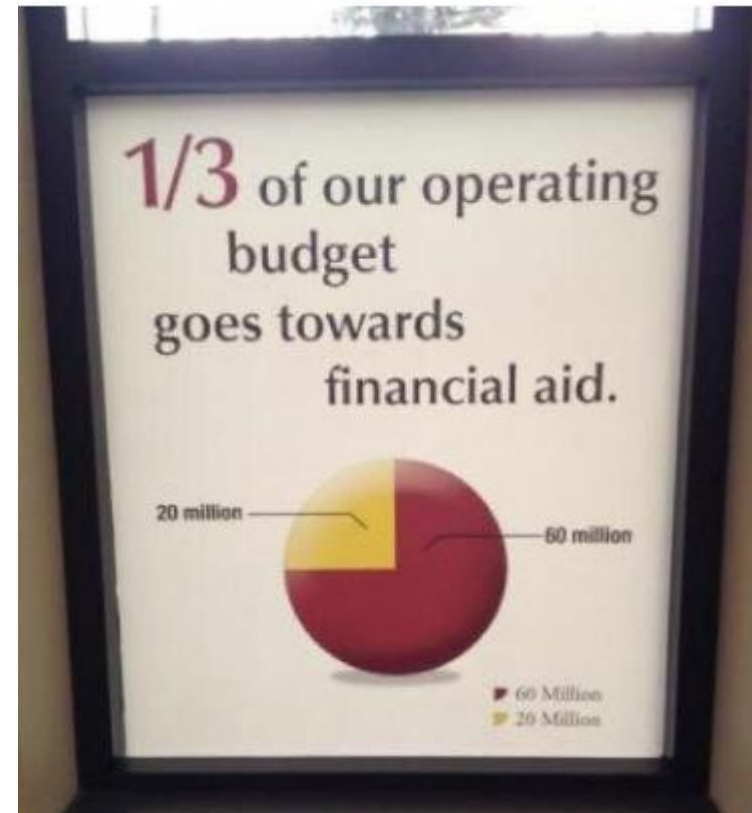
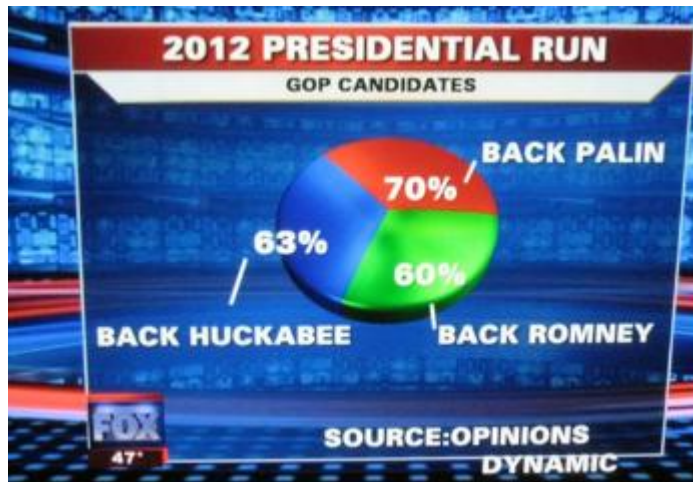
# Negativbeispiele – Zeit



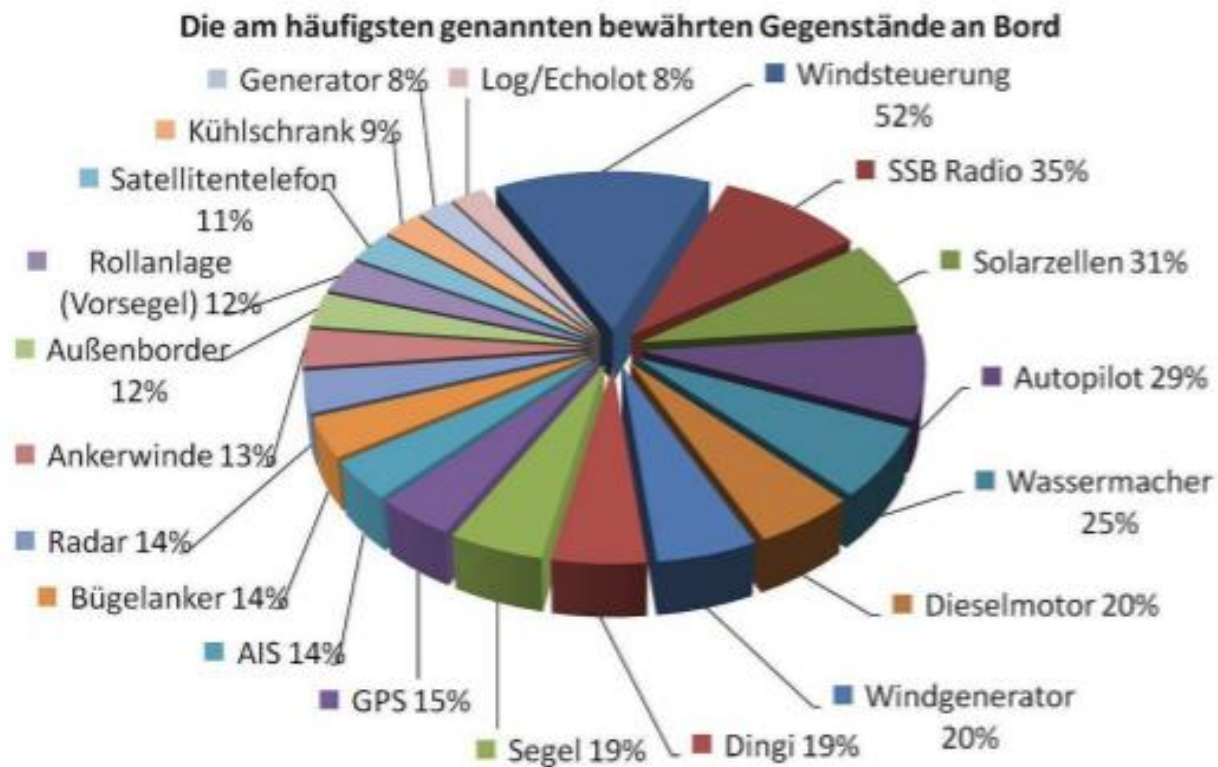
## Translate Tweet



# Negativbeispiele – Falsche Kreisdiagramme



# Negativbeispiele – überladen

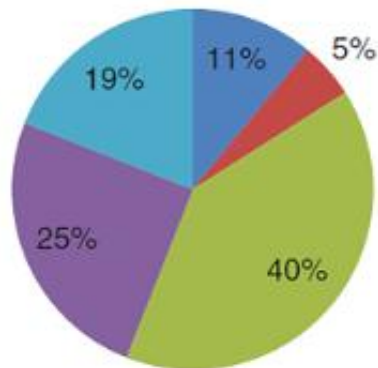


# Negativbeispiele – schwer zu vergleichen

## Survey Results

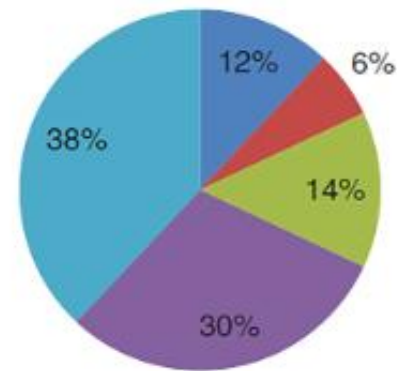
PRE: How do you feel about doing science?

■ Bored ■ Not great ■ OK ■ Kind of interested ■ Excited



POST: How do you feel about doing science?

■ Bored ■ Not great ■ OK ■ Kind of interested ■ Excited

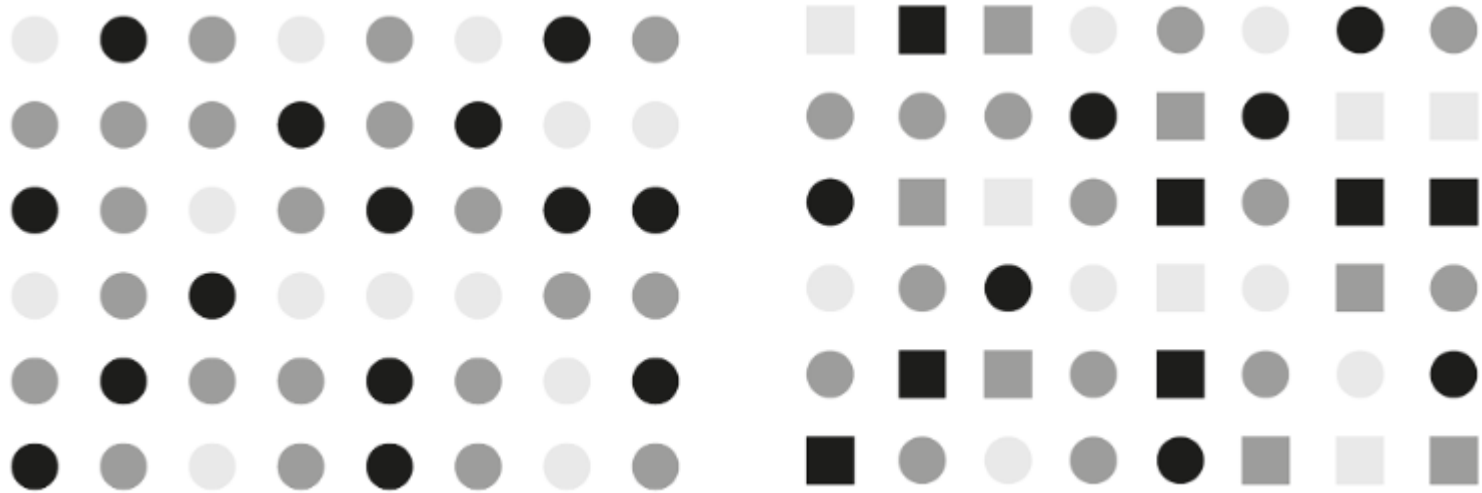


# Do

- Zielgruppe im Blick haben – Was wissen sie? Was wollen sie erfahren?
- In welchem Medium wird die Grafik abgebildet?
- Welches Ziel hat die Darstellung?
- Was soll hervorgehoben werden?
- Welcher Diagrammtyp passt zu den Daten?
- Durcheinander / Überladen vermeiden
- Storytelling
- Konsistenz
- Titel und Achsenbeschriftungen

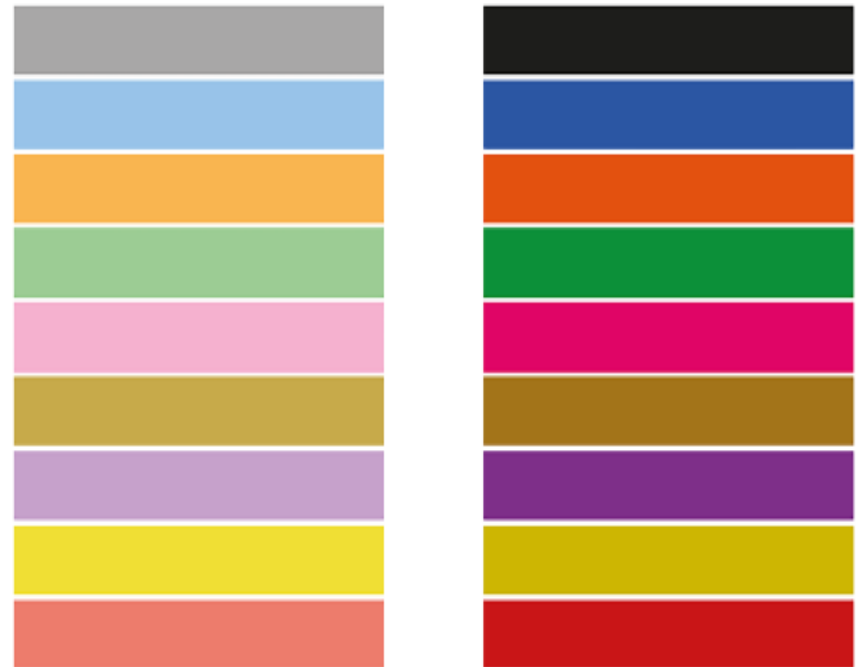
# Do

- Limitationen des Wahrnehmbaren:
  - Maximal 8 Farbtöne (je weniger desto besser)
  - Maximal 4 Orientierungen
  - Maximal 4 Größen



# Do

- Farbtöne bewusst auswählen!
  - Medium der Präsentation
  - Lichtverhältnisse
  - Einschränkungen der Betrachter
  - Gewählte Farben konsistent durchziehen
  - Generell besser geringe Sättigung, nur zum highlighten hohe Sättigung



# Do

Wenn alles heraussticht, sticht nichts heraus!

Country Level Sales Rank Top 5 Drugs

Rainbow distribution in color indicates sales rank in given country from #1 (red) to #10 or higher (dark purple)

Country	A	B	C	D	E
AUS	1	2	3	6	7
BRA	1	3	4	5	6
CAN	2	3	6	12	8
CHI	1	2	8	4	7
FRA	3	2	4	8	10
GER	3	1	6	5	4
IND	4	1	8	10	5
ITA	2	4	10	9	8
MEX	1	5	4	6	3
RUS	4	3	7	9	12
SPA	2	3	4	5	11
TUR	7	2	3	4	8
UK	1	2	3	6	7
US	1	2	4	3	5

Top 5 drugs: country-level sales rank

RANK		1	2	3	4	5+
COUNTRY   DRUG	A	B	C	D	E	
	Australia	1	2	3	6	7
Brazil	1	3	4	5	6	
Canada	2	3	6	12	8	
China	1	2	8	4	7	
France	3	2	4	8	10	
Germany	3	1	6	5	4	
India	4	1	8	10	5	
Italy	2	4	10	9	8	
Mexico	1	5	4	6	3	
Russia	4	3	7	9	12	
Spain	2	3	4	5	11	
Turkey	7	2	3	4	8	
United Kingdom	1	2	3	6	7	
United States	1	2	4	3	5	

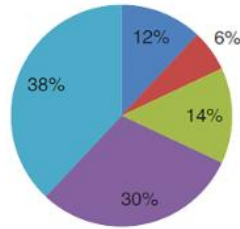
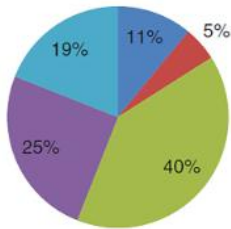
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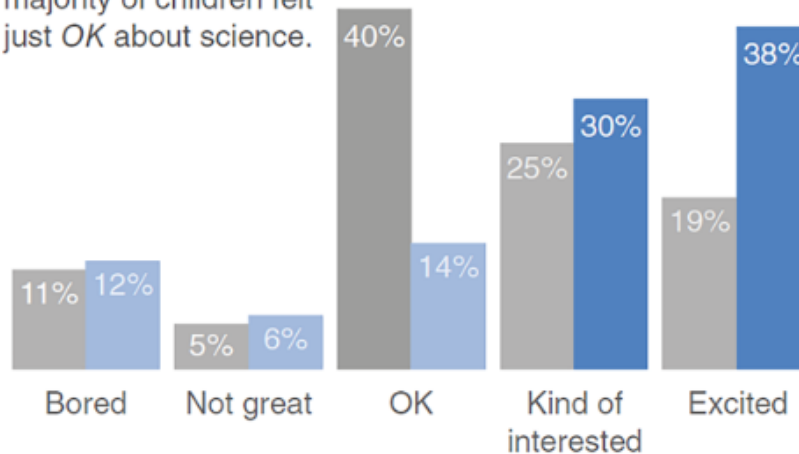


Essentielle Informationen  
gut vergleichbar darstellen

## Pilot program was a success

How do you feel about science?

**BEFORE** program, the majority of children felt just *OK* about science.

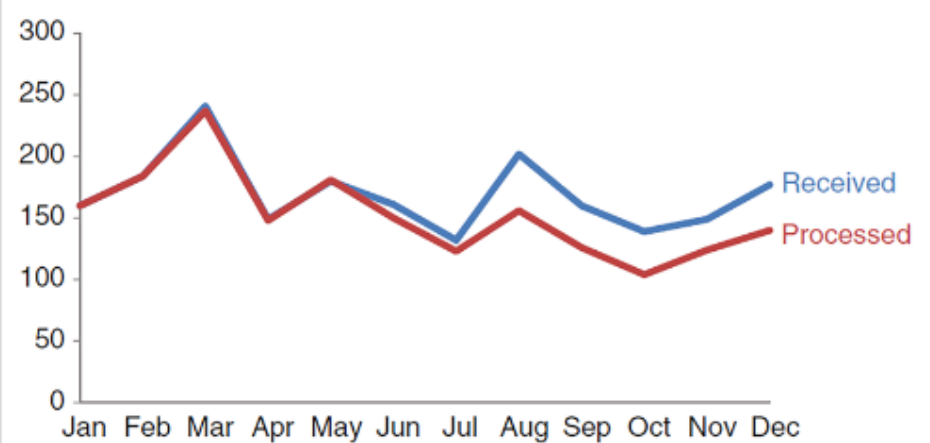
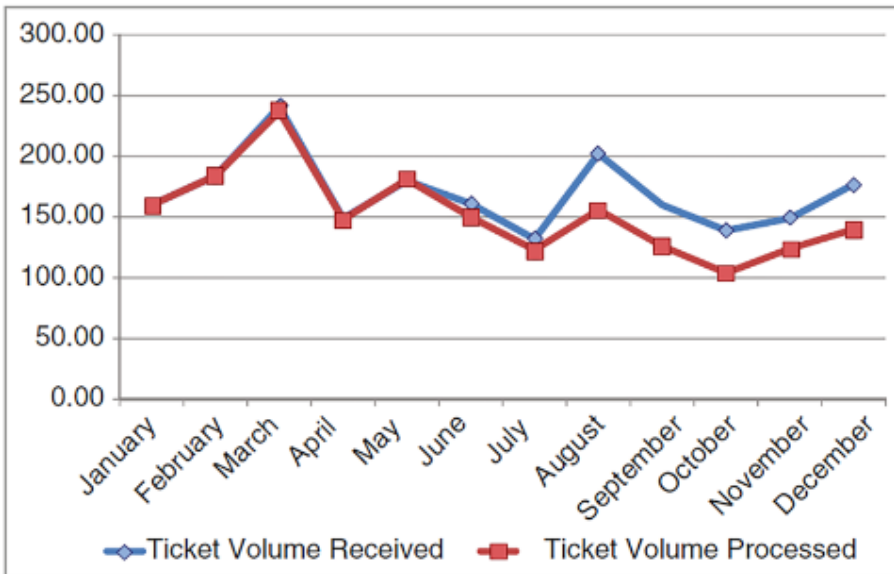


**AFTER** program, more children were *Kind of interested* & *Excited* about science.

Based on survey of 100 students conducted before and after pilot program (100% response rate on both surveys).

# Do

„Ausmisten“



# Do

Farbskalen zum Aussuchen:

- über Hex-Codes

<https://colorbrewer2.org>

Google color picker

- Integrierte Farbpaletten:

<https://r-graph-gallery.com/38-rcolorbrewers-palettes.html>

- Benamte Farben: (657, via colors() )

<https://r-graph-gallery.com/42-colors-names.html>