

*A TALK THAT SHOWS SOME BAAAD CHARTS,
SAYS WHY THESE ARE BAAAD CHARTS, AND
INCLUDES DISCUSSION OF HOW
THE CHARTS COULD BE IMPROVED*

**Daniel Brooks Wright
Evaluation – PED**

**Lots of other information that you will probably
not write down, is too small to read, is in a color
that is tricky to see against this un-necessary
background, and may be mes-spilt.**

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Making Bad Charts



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Making Bad Charts

Dan Wright

Evaluation

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Confusing People with Numbers

“Concentrate on methods of data display that leave the viewers as uninformed as they were before seeing the display or, worse, those that ~~induce confusion~~”

(Wainer, 1984, p. 137)

And how to do a bad PowerPoint.

Three Modes of (Mis)Communication

- Numbers
- Words
- Pictures (Charts)

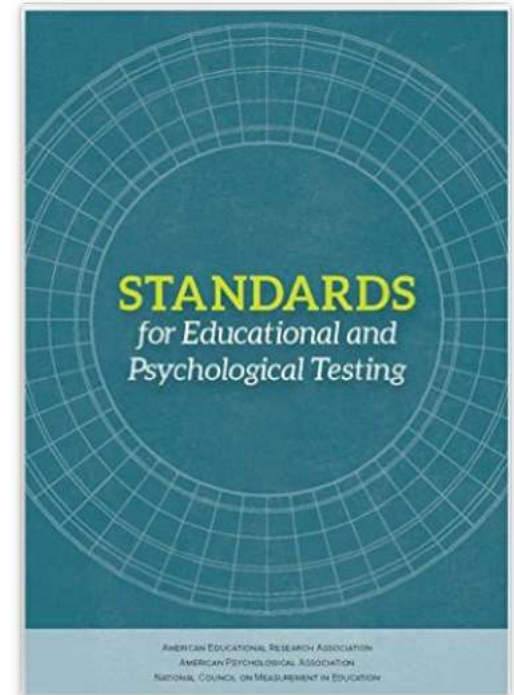
I will tell you how to present information badly (and then show how to avoid this!).

Number Miscommunication

- Round inappropriately

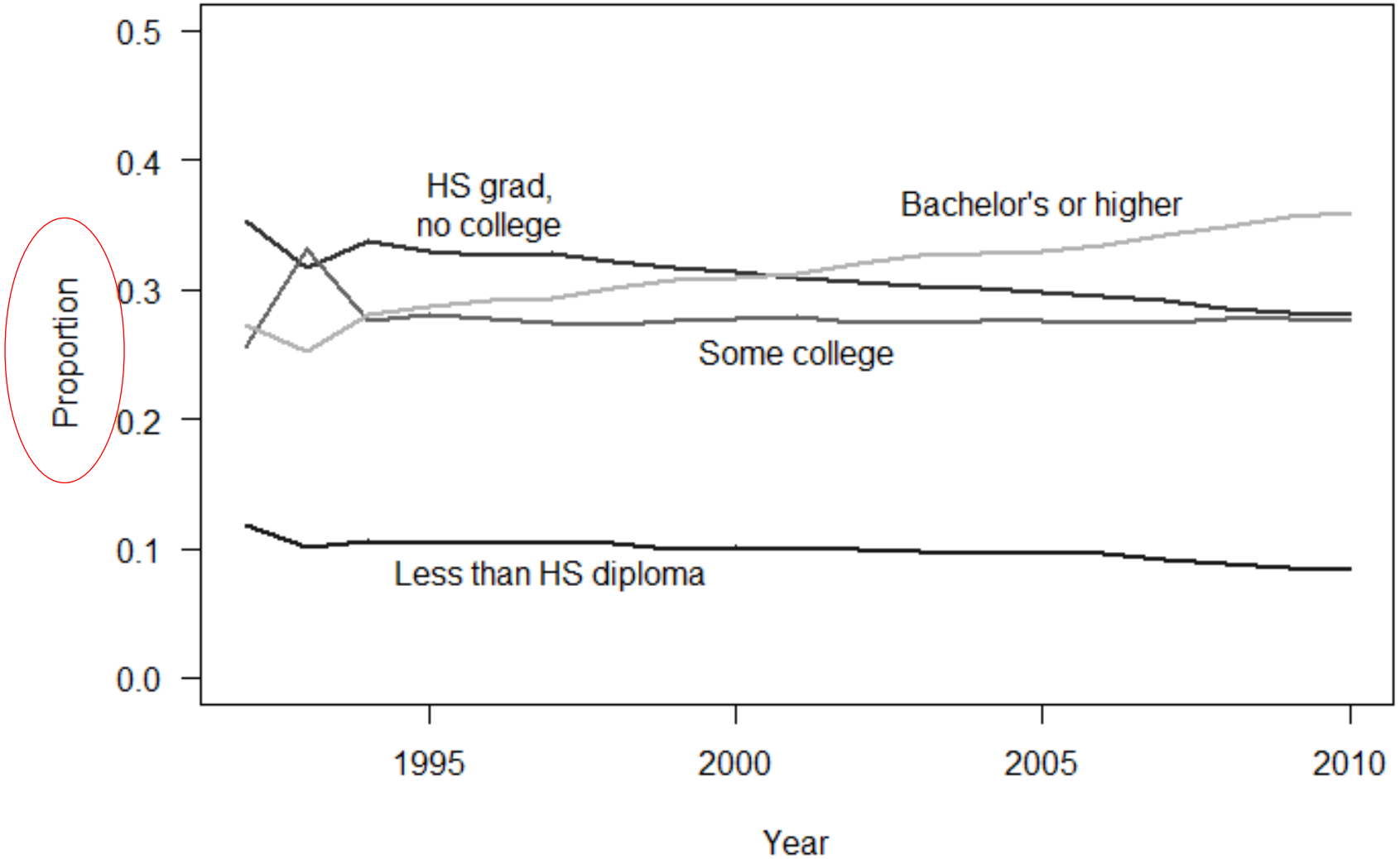
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R R Console  
> 40/70  
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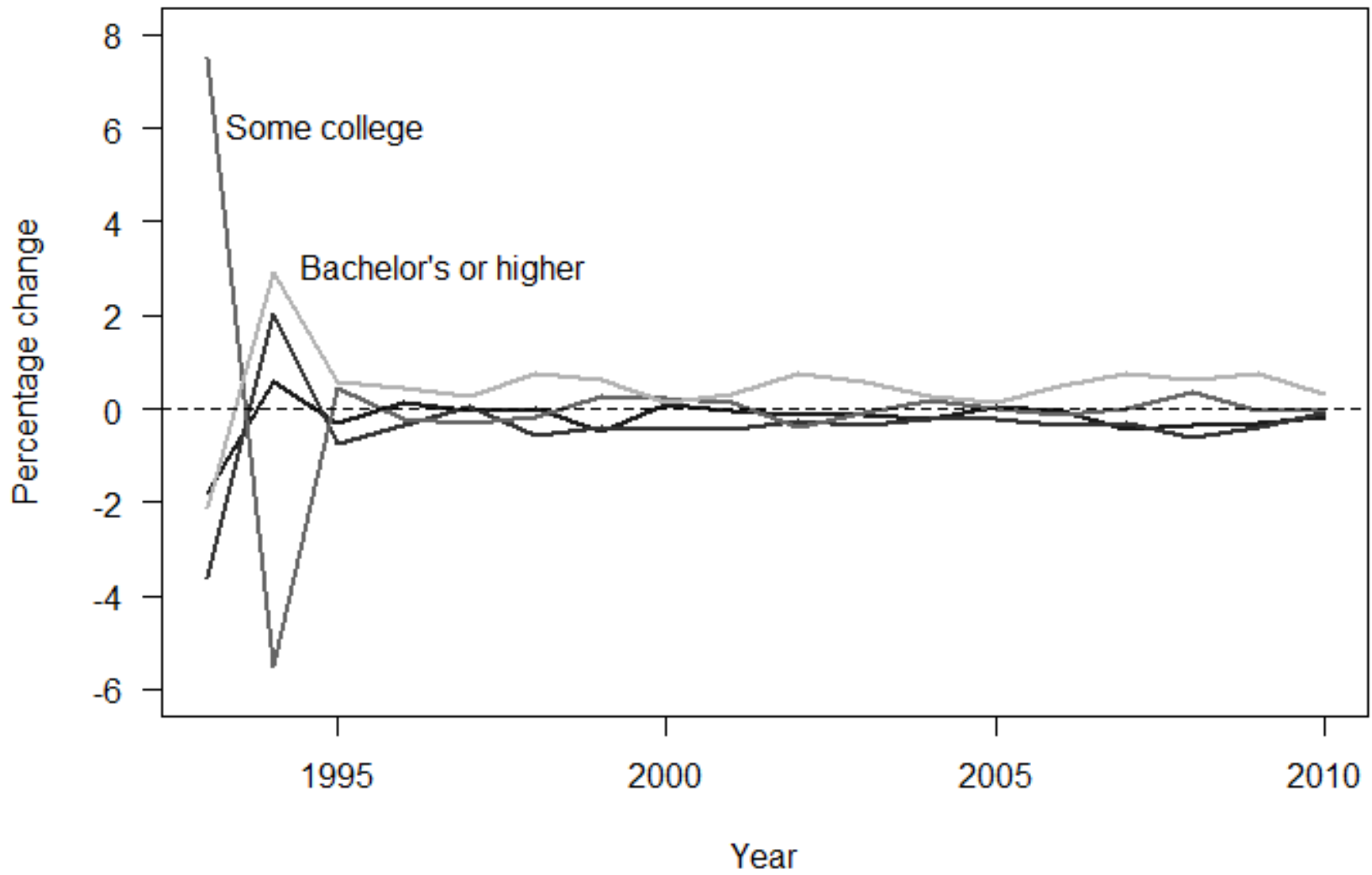
- Avoid guidelines.
Testing organizations publish this →
- Do not understand the statistics
that you are presenting to others.
- Avoid ways for making clear tables
(there are books for making good tables).

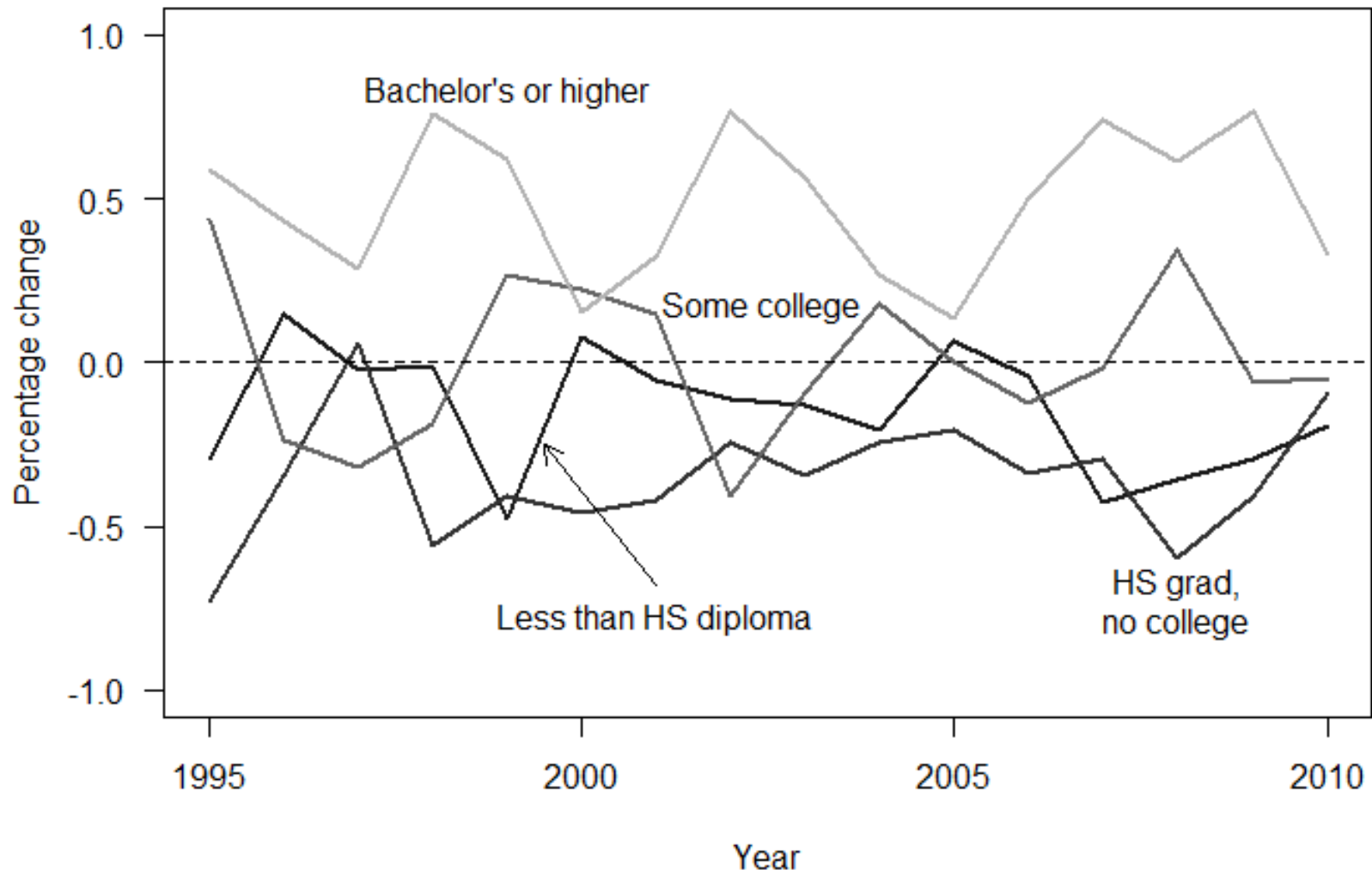


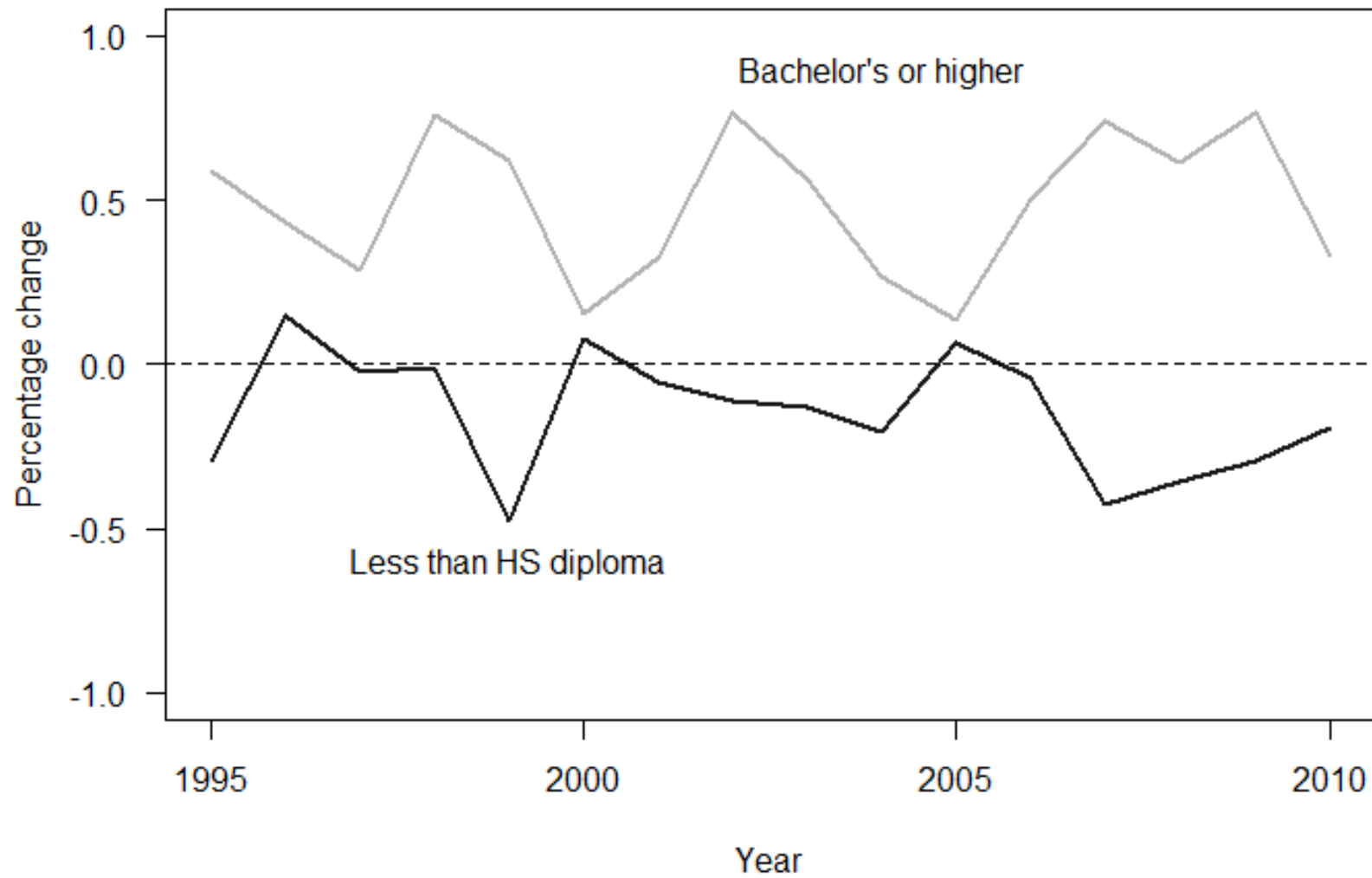
Number of Employed People 25 years and Over by Educational Attainment (1992–2010 annual averages)

Year	Less than a high school diploma	High school graduates, no college	Some college or associate degree	Bachelor's degree and higher
1992	11,843,000	35,305,000	25,526,000	27,273,000
1993	11,201,000	35,395,000	26,903,000	28,115,000
1994	11,053,000	35,135,000	28,696,000	29,257,000
1995	10,945,000	34,999,000	29,681,000	30,412,000
1996	11,317,000	35,300,000	29,994,000	31,459,000
1997	11,546,000	36,163,000	30,321,000	32,488,000
1998	11,673,000	35,976,000	30,477,000	33,730,000
1999	11,294,000	36,017,000	31,209,000	34,905,000
2000	11,692,000	36,452,000	32,308,000	36,020,000
2001	11,669,000	36,078,000	32,586,000	36,514,000
2002	11,535,000	35,779,000	32,094,000	37,395,000
2003	11,537,000	35,857,000	32,420,000	38,570,000
2004	11,408,000	35,944,000	32,977,000	39,293,000
2005	11,712,000	36,398,000	33,625,000	40,225,000
2006	11,892,000	36,702,000	34,143,000	41,649,000
2007	11,521,000	36,857,000	34,612,000	43,182,000
2008	11,073,000	36,097,000	35,040,000	43,951,000
2009	10,371,000	34,487,000	33,888,000	43,531,000
2010	10,115,000	34,293,000	33,717,000	43,832,000









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Word Miscommunication

- Use flowery "thesaurus-style" writing.
- Show your novelist (or artist) aspirations.
- Don't worry about accuracy. Be overly confident and use causal phrases inappropriately.
- Write small for slides and use multiple *weird* fonts.
- Rules grammar ignored can be (spelleng two).
- Write as if you are writing for someone with a PhD in statistics. Make it sound complex! (lots of colors)
- Don't bother explaining odd procedures.
- Sound bored (use these effects to prove it).

POWERPOINT IS EVIL

Power Corrupts.

PowerPoint Corrupts Absolutely.



Edward Tufte

Imagine a widely used and expensive prescription drug that promised to make us beautiful but didn't. Instead the drug had frequent, serious side effects: It induced stupidity, turned everyone into bores, wasted time, and degraded the quality and credibility of communication. These side effects would rightly lead to a worldwide product recall.

From Wired (2003)

(yes, I know that I am using PowerPoint)

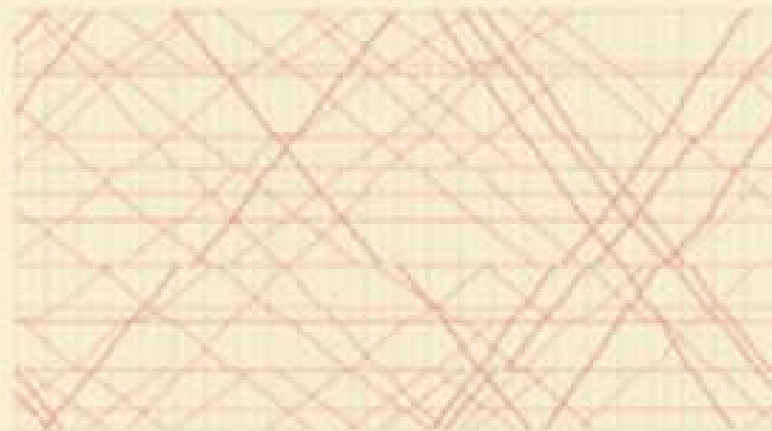
Rules for Graphical Presentation

Wainer (1984)

1. Show the data
2. Show the data accurately
3. Show the data clearly

Tufte (2001, p. 105)

1. Above all else show the data
2. Maximize the data-to-ink ratio
3. Erase non-data-ink (chartjunk)
4. Erase redundant data-ink
5. Revise and edit

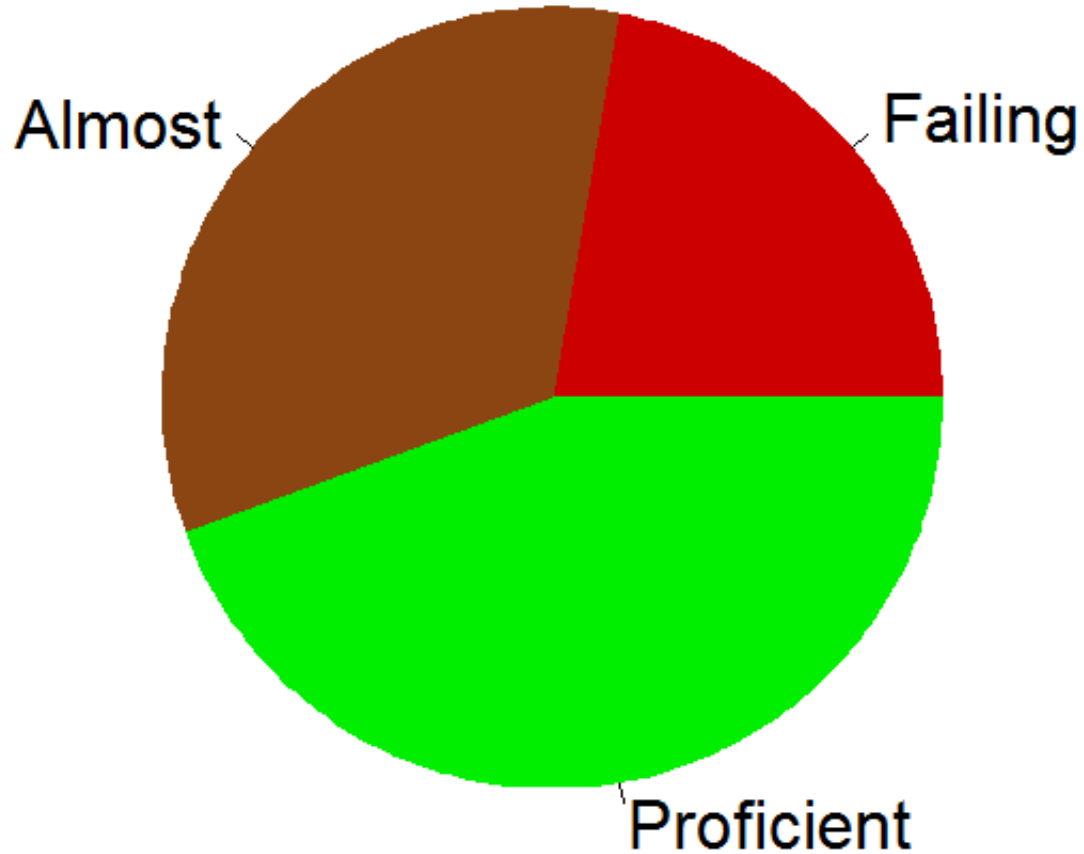


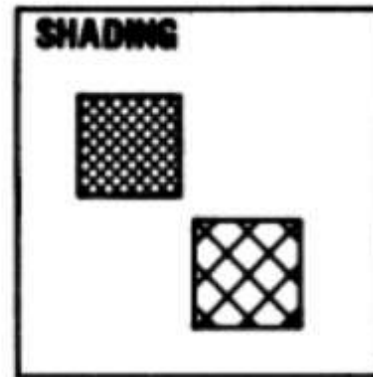
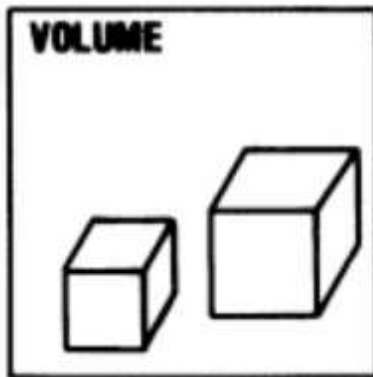
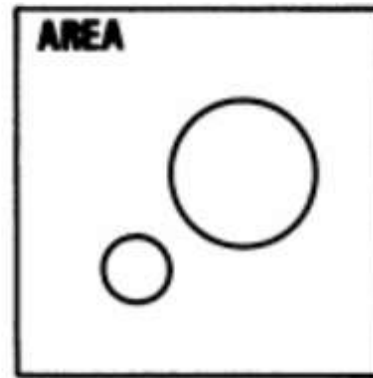
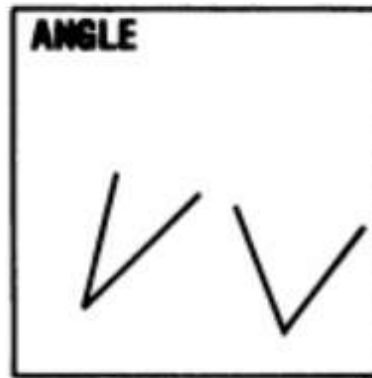
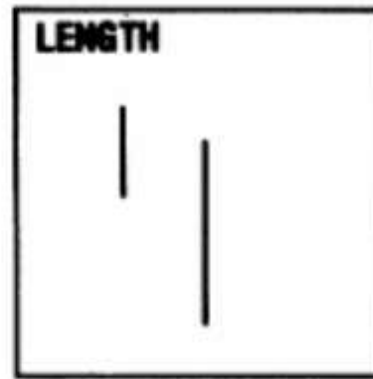
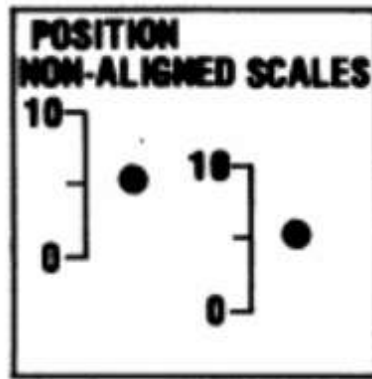
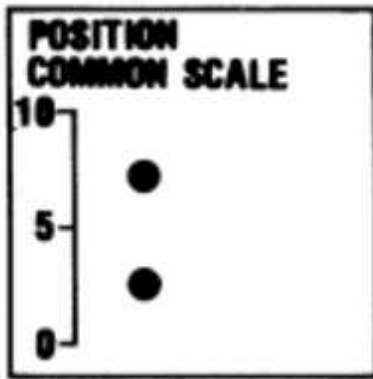
SECOND EDITION

The Visual Display
of Quantitative Information

EDWARD R. TUFTE

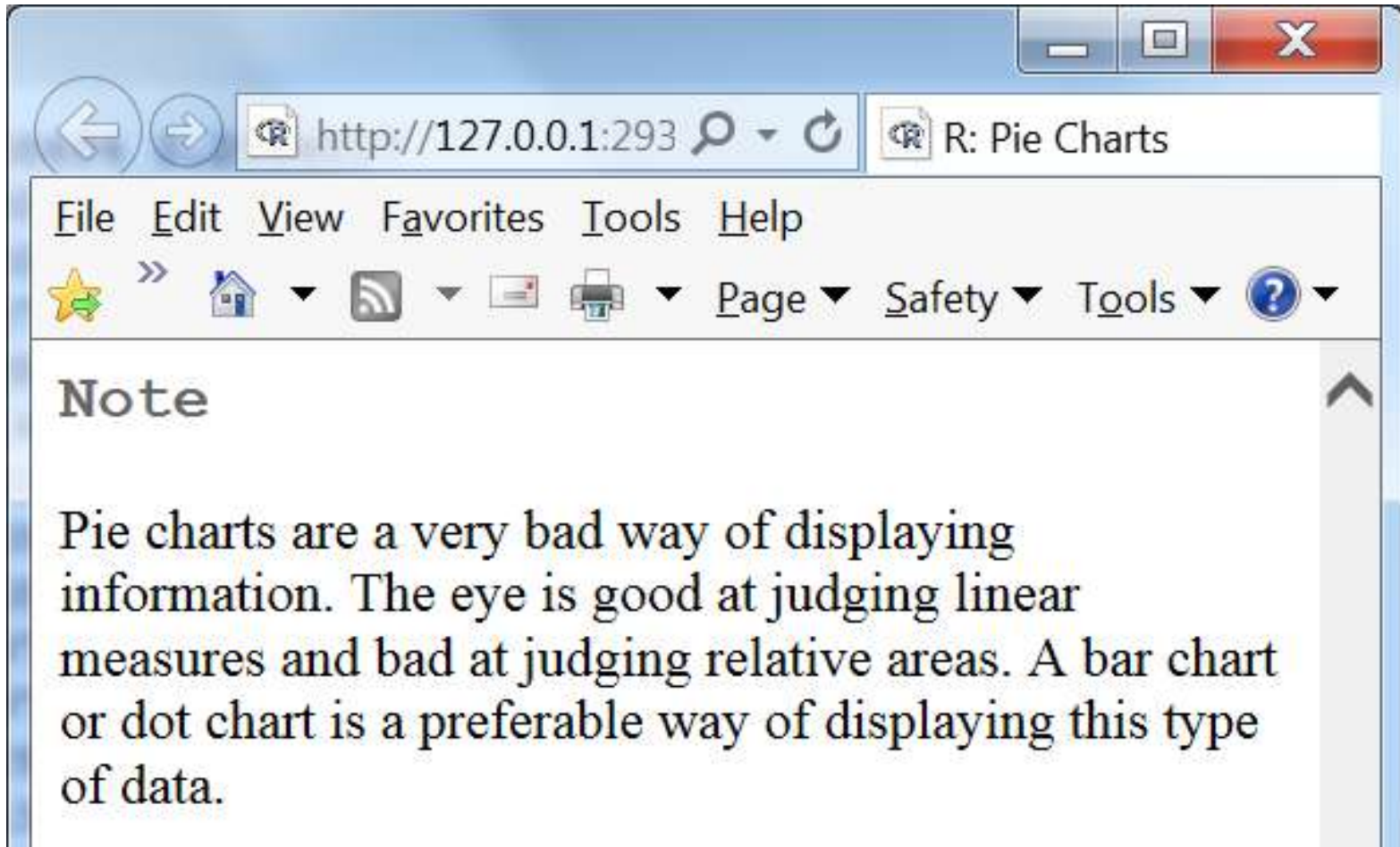
Knowledge of How Vision Works can be Useful





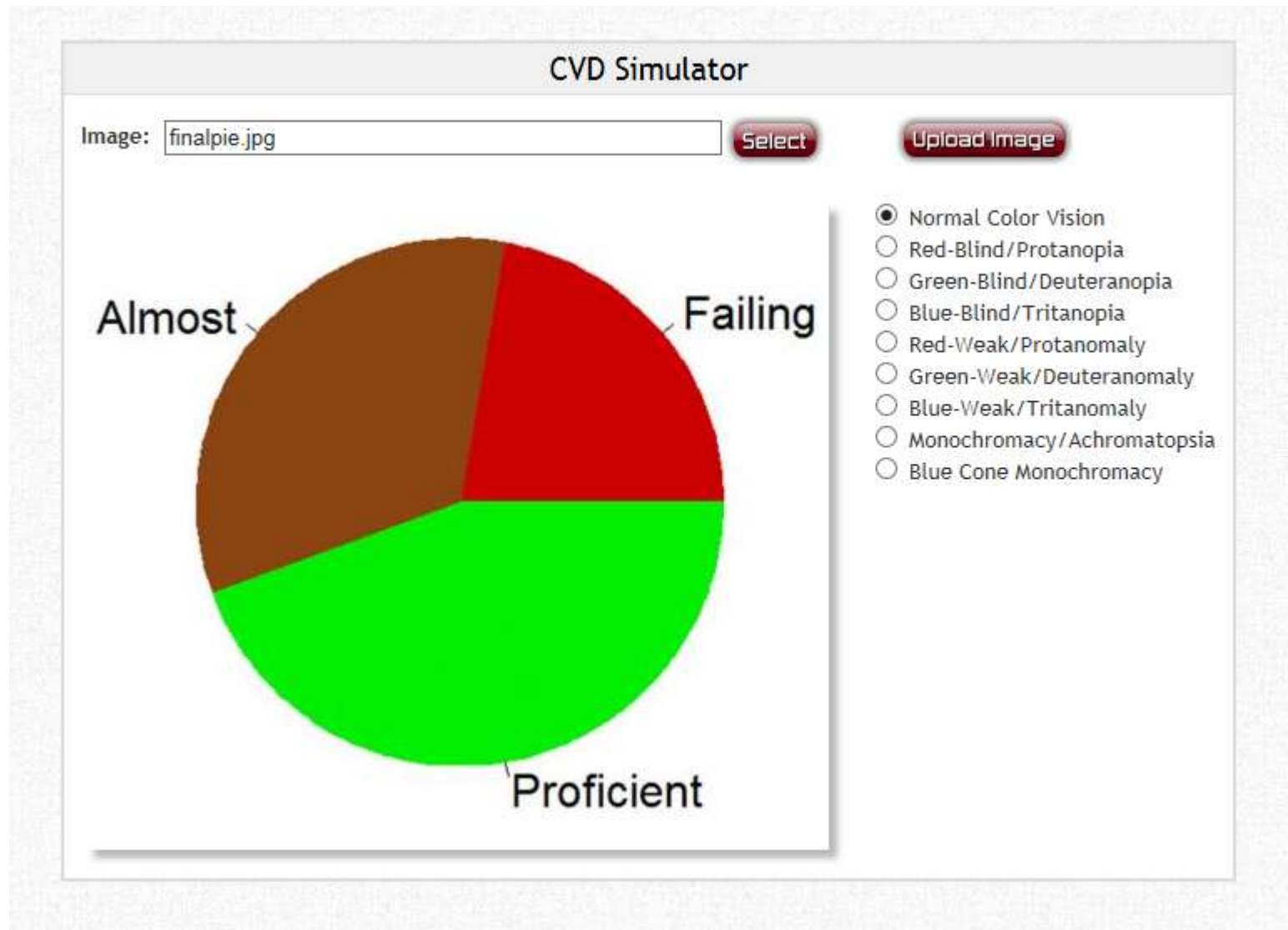
COLOR SATURATION

(Cleveland and McGill, 1984)

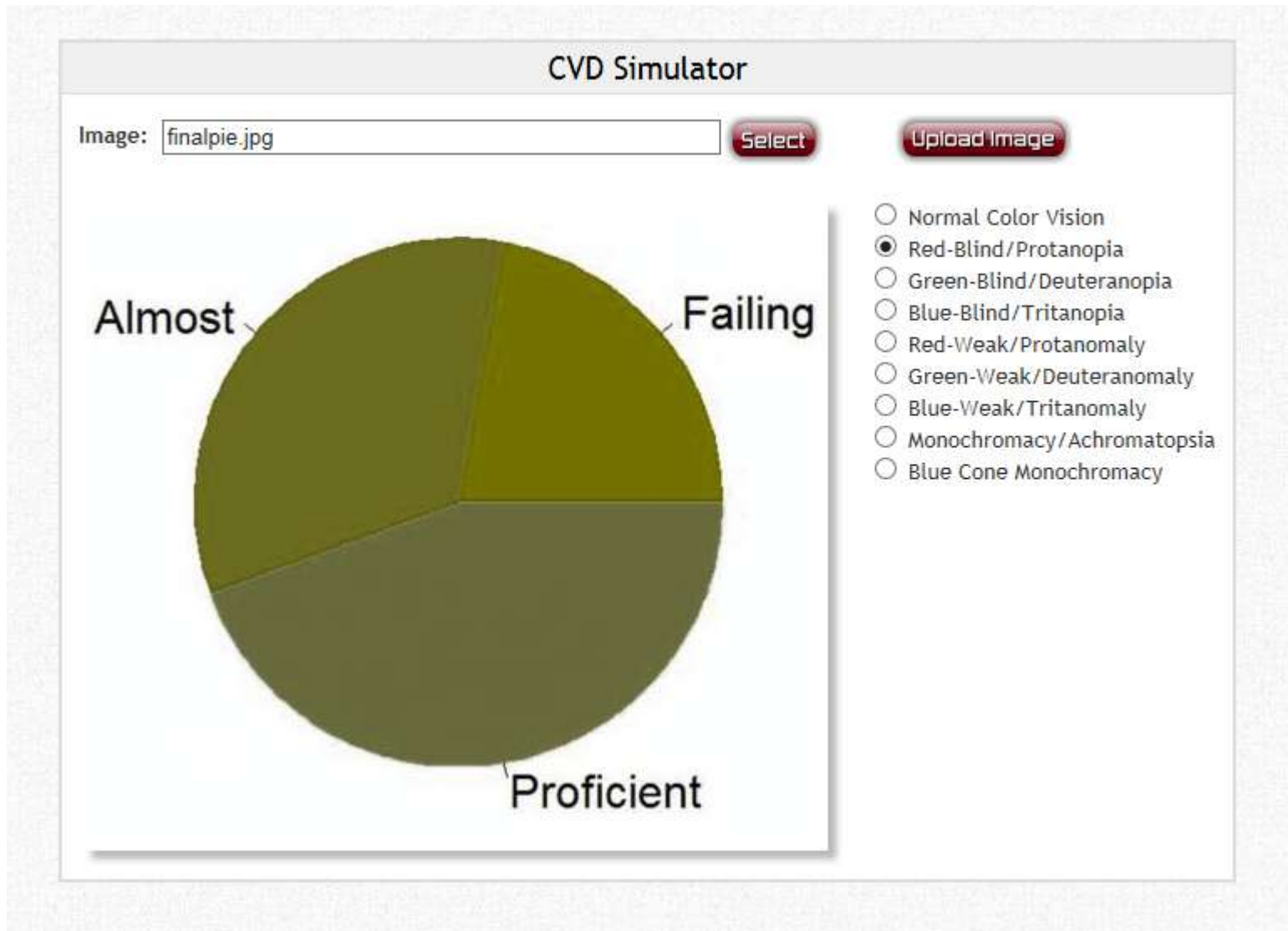


Note

Pie charts are a very bad way of displaying information. The eye is good at judging linear measures and bad at judging relative areas. A bar chart or dot chart is a preferable way of displaying this type of data.



Insensitivity to red light.
Most common form of color blindness.

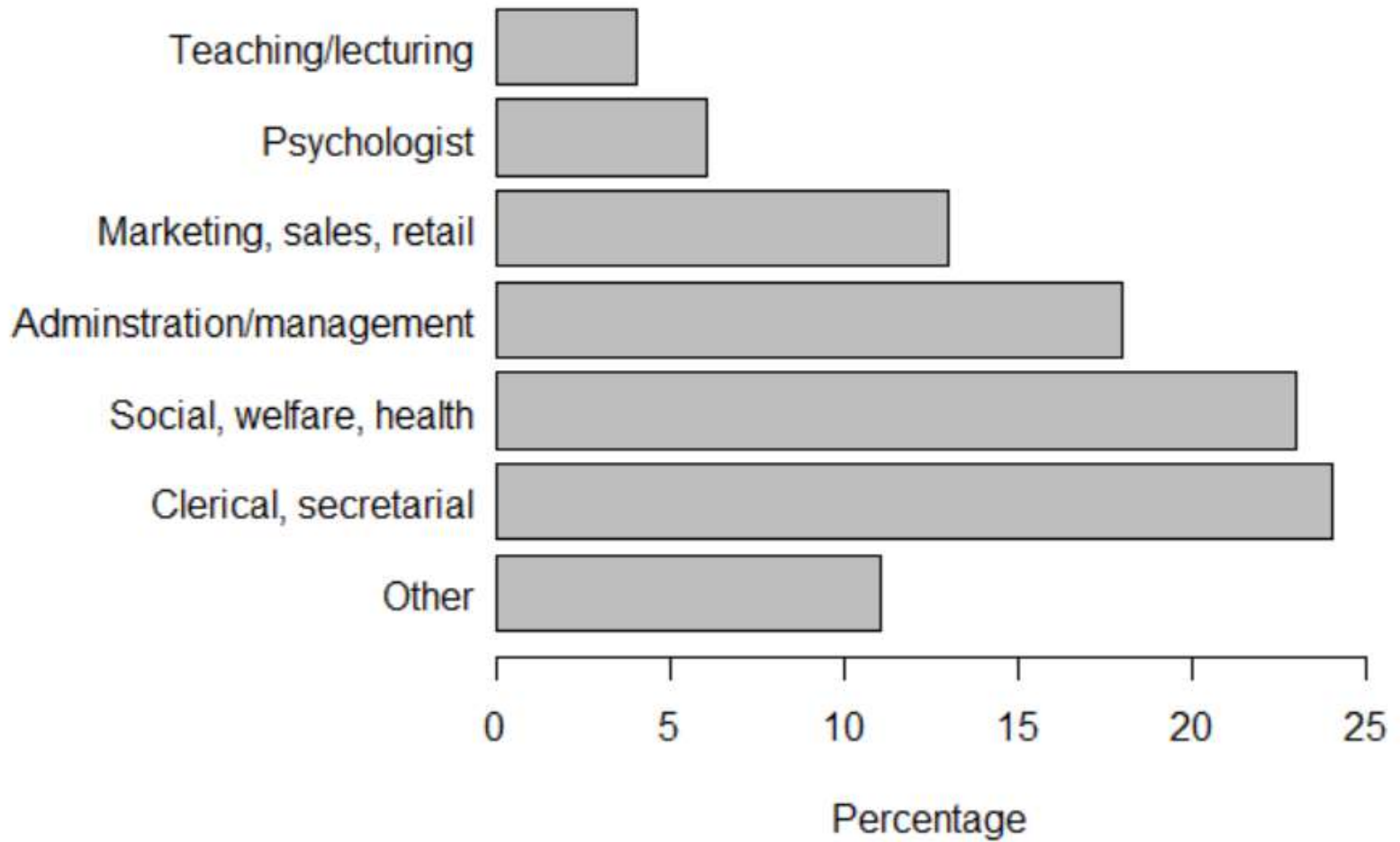


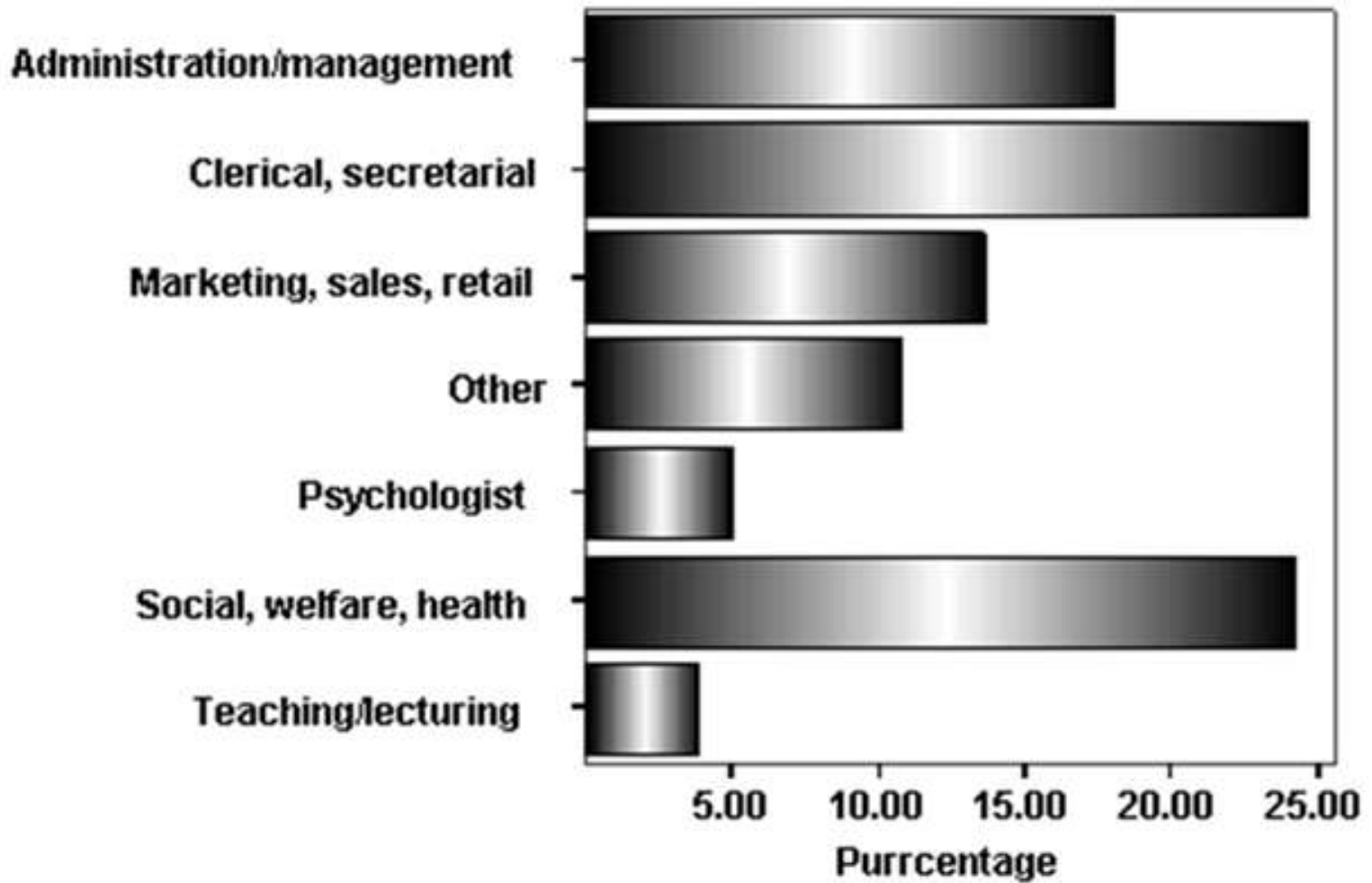
Handouts should work if photocopied without color.
Filters and Palettes designed for color-blind and grey-scales.

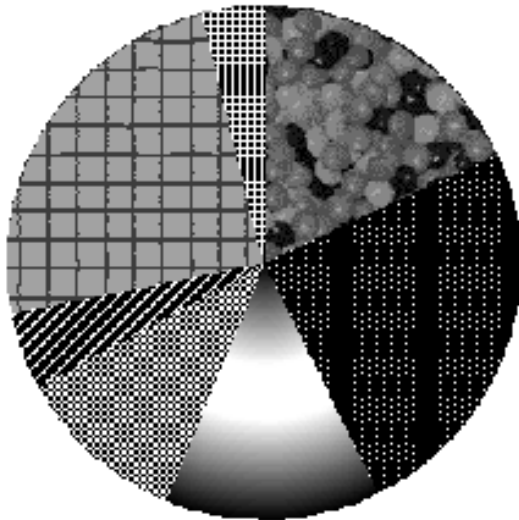
Failure	23%
Almost	33%
<u>Proficient</u>	<u>44%</u>
	100%

Tufte's data-to-ink ratio

Where do Psychology Graduates go?







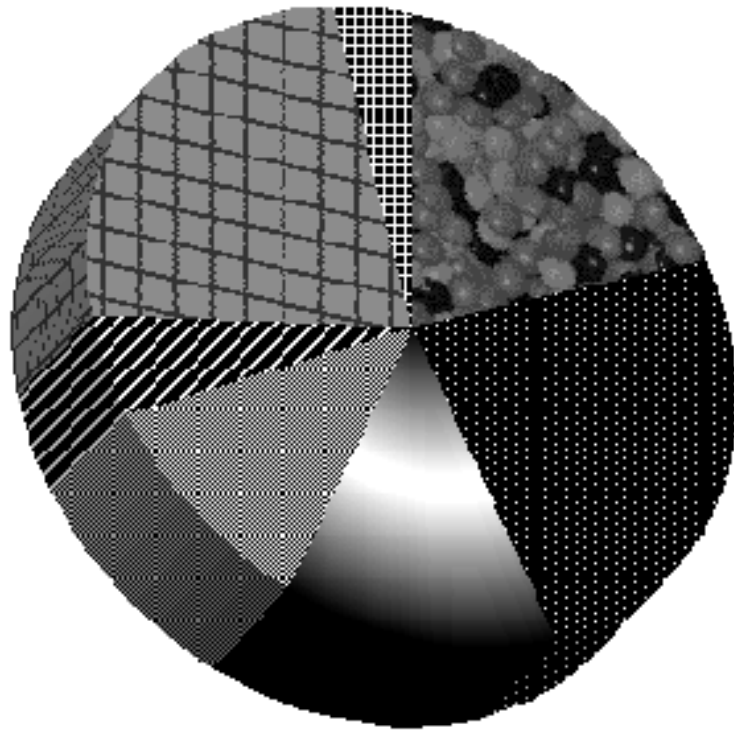
■ Administration/management
■ Clerical, secretarial
■ Marketing, sales, retail
■ Other

■ Psychologist
■ Social, welfare, health
■ Teaching/lecturing

... a false third dimension. This is at best a waste of ink and is likely to make the graph more difficult to read. ... Wallgren and colleagues (1996: 71) suggest this is included because it 'symbolize[s] the triumph of data technology' over thought.

When we politely criticize people for adding a false dimension to a graph, they often tell us it looks 'pretty'. 'Pretty' does not count. Information, clarity, and accuracy count. 'Pretty' is fine providing these other three are fulfilled.

(from Wright & London, 2009, statistics textbook)



- Administration/management
- Clerical, secretarial
- Marketing, sales, retail
- Other
- Psychologist
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According to SYSTAT manual (Wilkinson, 2000, p. 13) these false 3d pie charts “incorporate nearly every visual illusion discussed in this chapter.”



Psychology

What makes psychology a unique field of study?



Psychology is the scientific investigation of mind and behaviour
the study of how people think, act, react and interact

- * It has applications in every facet and context of human life
- * It bridges the gap between the sciences and the arts
- * It utilises the skills of both literacy and numeracy
- * Many theories are generated from a variety of innovative forms of investigation
- * It incorporates sub-disciplines as diverse as psychoanalysis and cognitive science
- * Graduates are equipped with enhanced understanding of human behaviour
- * It can be combined with the study of many other disciplines, for example: computer science, biology, business, education, health sciences, law

Psychology is not the art of mind reading
the study of common sense
the same as psychoanalysis or counselling
another word for psychiatry

Misconceptions about studying psychology

You need A-level psychology. No... good grades are the most important thing, though A-level psychology might be a useful foundation.

A psychology degree leads automatically to a career in professional psychology. No... see career directions below.

Psychology is more suited to female students. No... given the breadth of the field and the diversity of research, both men and women find psychology interesting.

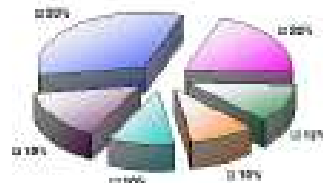
A good student needs to be a 'people person'. No... the field attracts many different personalities with widely differing interests.

Psychology is about 'helping people'. No... although the study of psychology contributes to psychotherapy and counselling.

- Can group decisions lead to war?
- Why do car advertisements include attractive women?
- What impact does divorce have on children?
- Why do some people get depressed?
- How can road rage be controlled?
- Why do I sometimes perform better when I concentrate less?

Studying psychology can provide you with a scientific toolkit to collect and analyse evidence about these kinds of questions. It opens up opportunities to apply psychological knowledge at work, rest and play.

Career directions



- Health, education and childcare
- Business and public sector administration and management
- Social work, welfare and community work
- Marketing, sales, business and finance, IT
- Professional psychology
- Other

See www.careers.ac.uk

Professional psychology

- * Clinical psychology
- * Counselling psychology
- * Educational psychology
- * Forensic psychology
- * Health psychology
- * Occupational psychology
- * Neuropsychology
- * Teaching and Research
- * Psychotherapy
- * Sport psychology

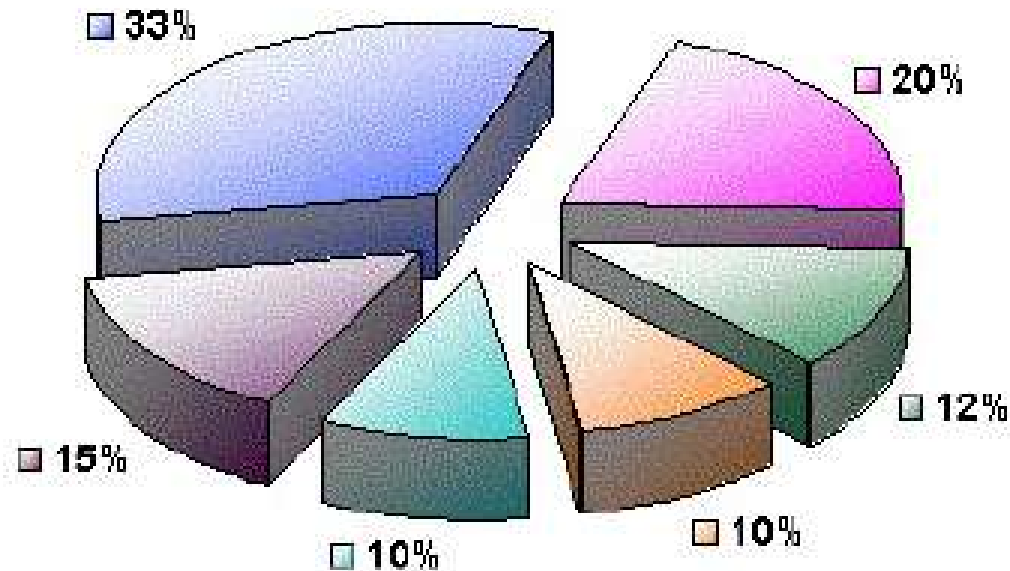


Higher Education Academy
Psychology Network

www.psychology/hea.ac.uk

www.bps.org.uk/careers/careers.cfm

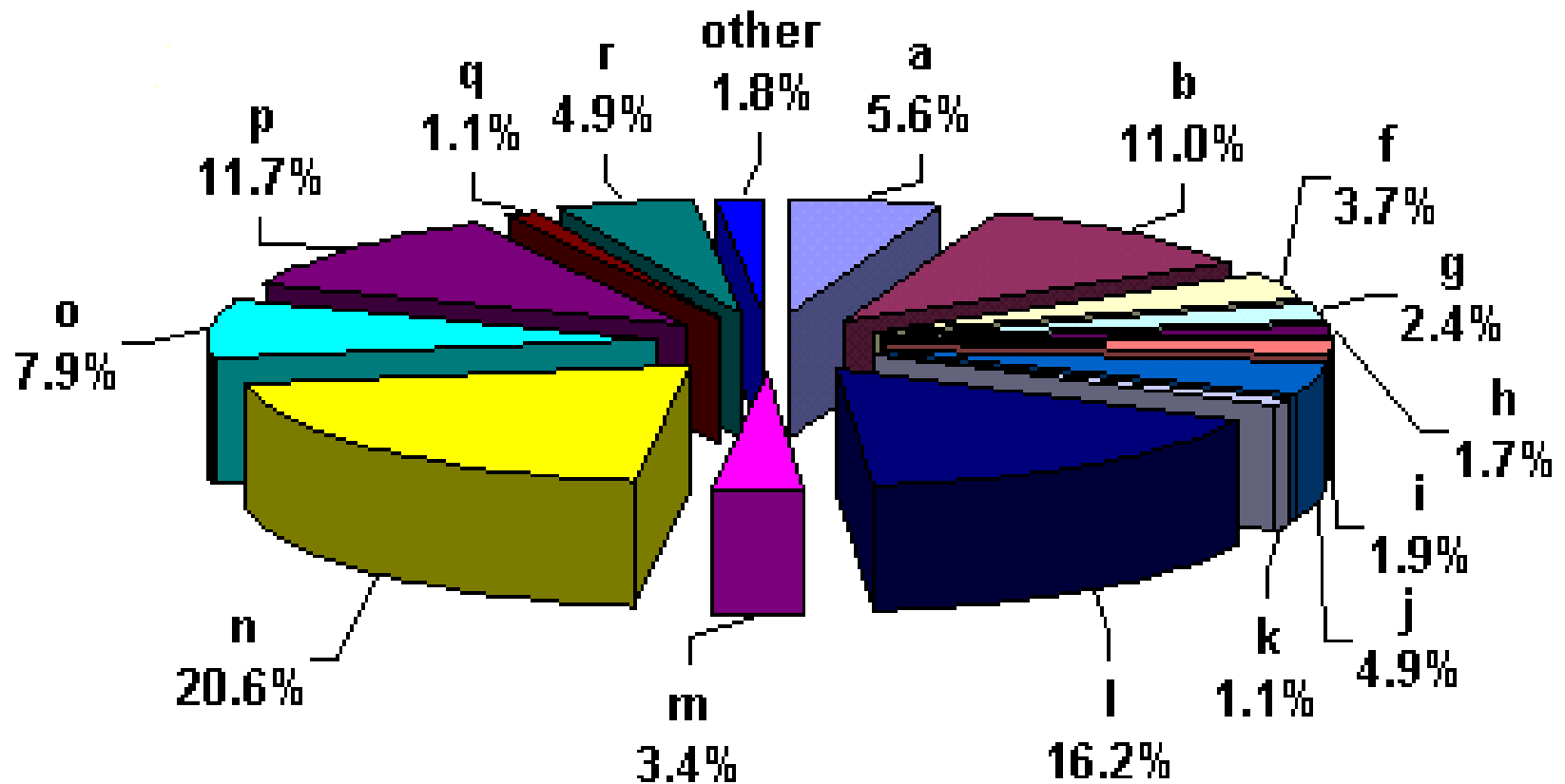
Career directions



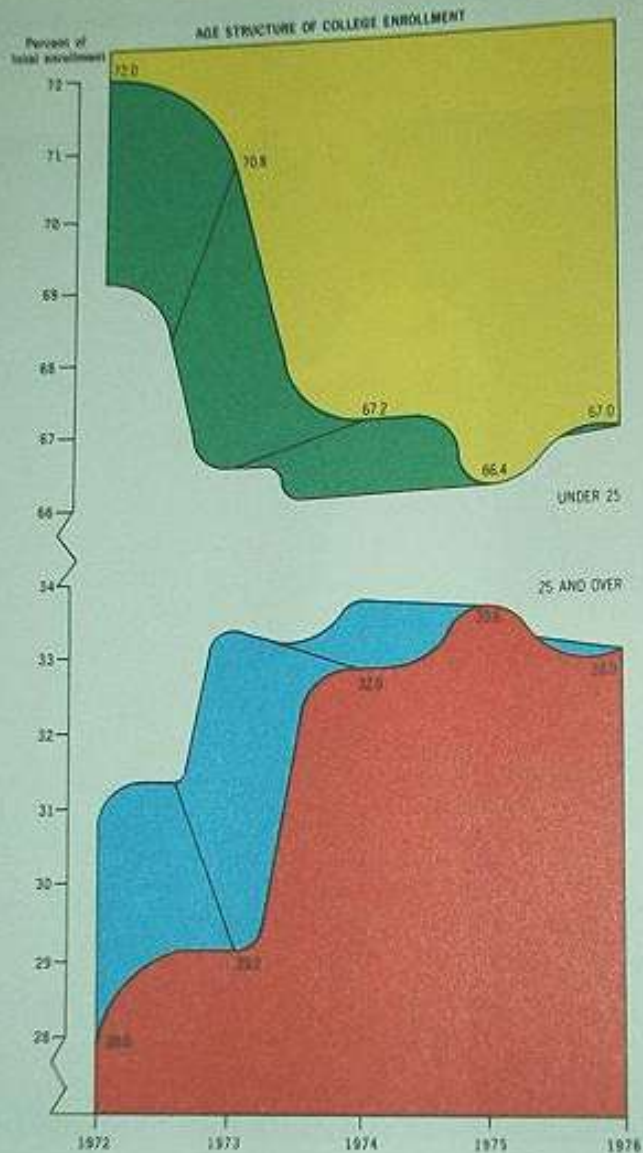
- Health, education and childcare
- Business and public sector administration and management
- Social work, welfare and community work
- Marketing, sales, business and finance, IT
- Professional psychology
- Other

See www.prospects.ac.uk

Here is what is on *prospects.ac.uk*

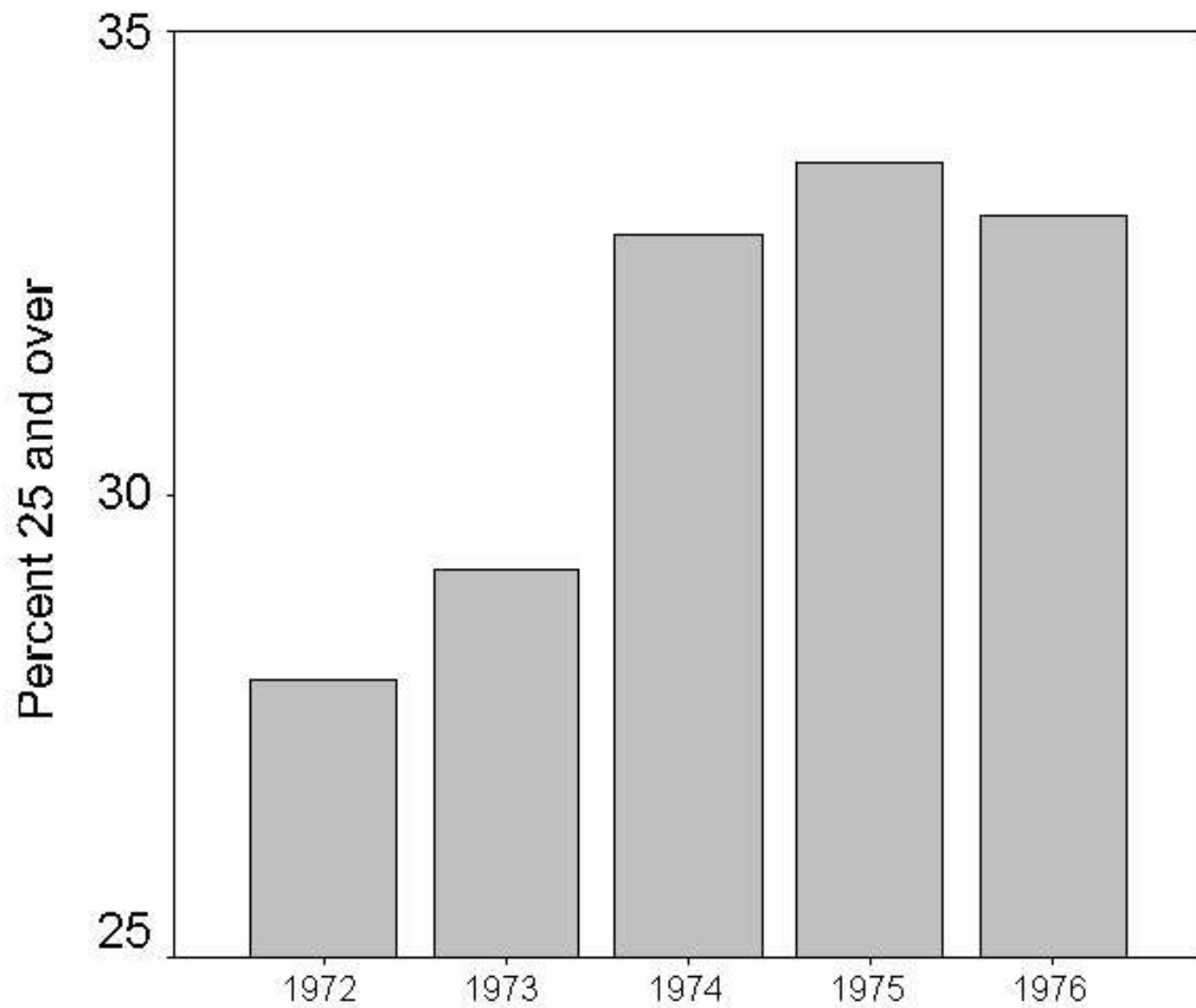


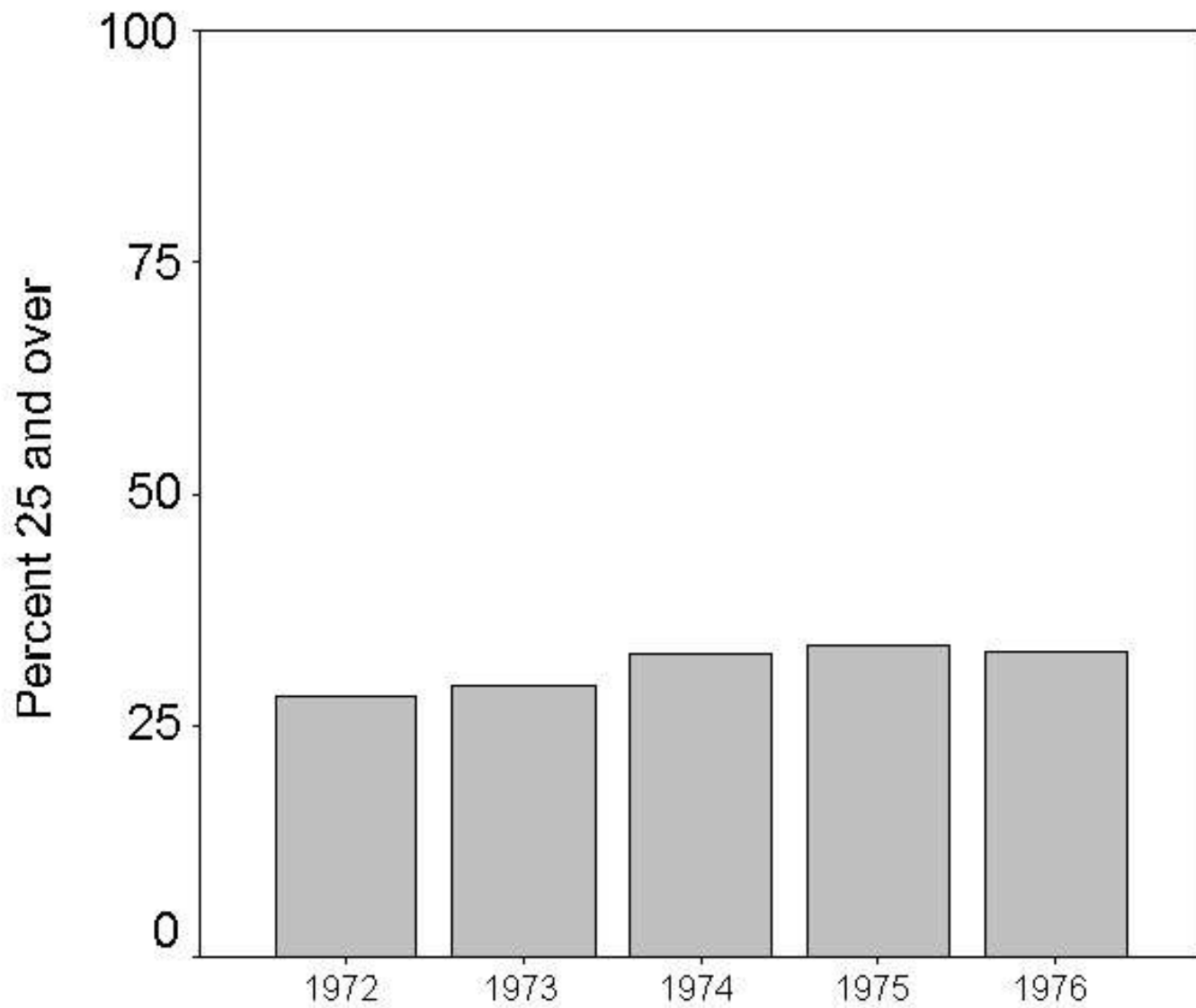
happens, only five pieces of data (since the total enrollment each year adds to 100 percent). This may well be the worst graphic ever to find its way into print:

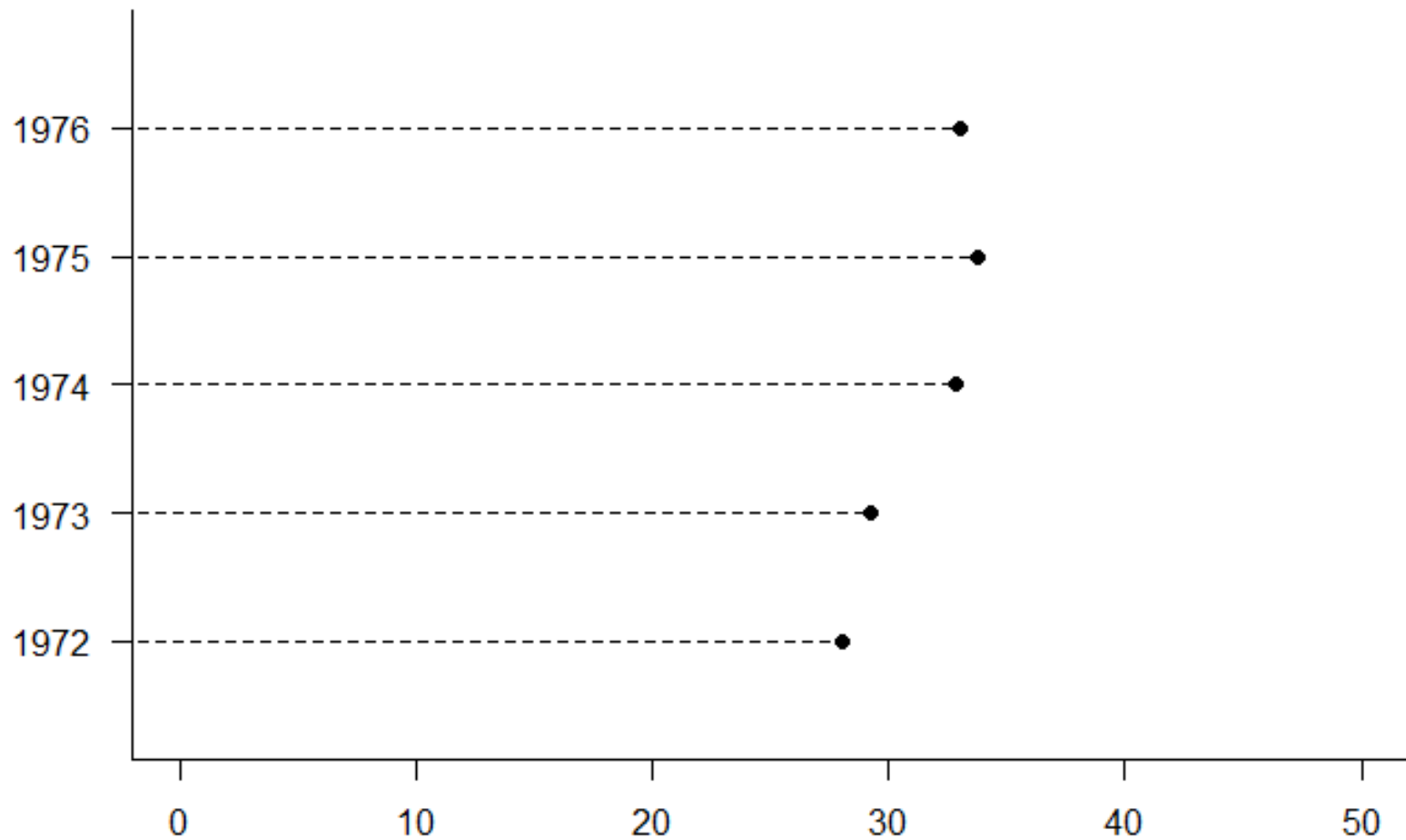


from Edward Tufte (2001)

“may well be the worst graphic ever”

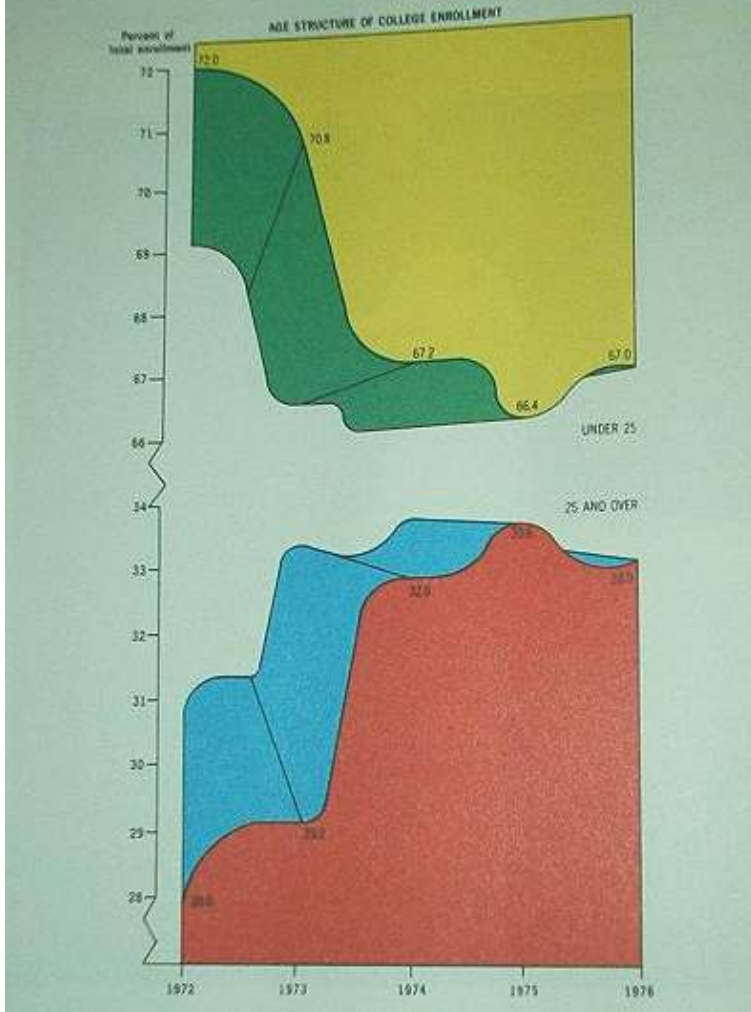




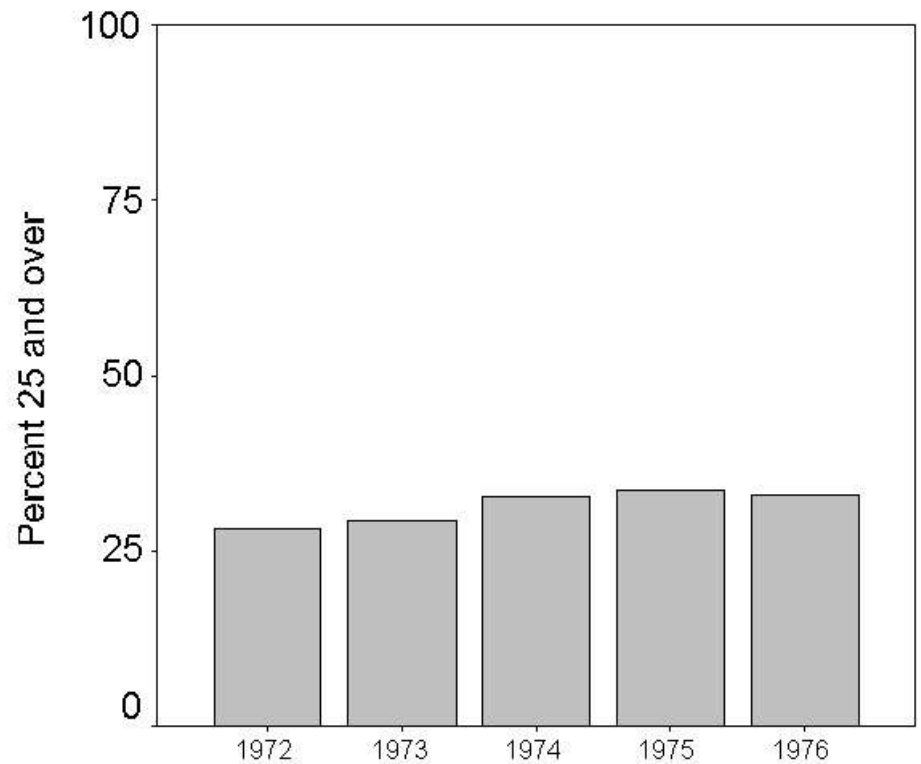


Percentage of Students over 25

happenstance, only five pieces of data (since the total for each year adds to 100 percent). This may well be the worst graphic ever to find its way into print:



The “aaaah” factor???



You: “Dan, this so-called ***Chartjunk*** that you do not like IS sometimes useful. It looks pretty and draws attention to the reader.”

Dan: “It interferes with communication of the information. It belittles your audience to say that they will only look at your graph if it is pretty. If the data are ugly, the data are ugly.”

If you desire, show your clear, informative graph and then show ...



Another Example

What is Dan's favorite baseball team?





Dodgers

While my shirt shows that I am a fashionable trendy person with stunning dress-sense, it does not communicate information about “which baseball team” well.

Making a Good Chart

- Same rules for numeric, verbal, and graphical modes of communication.
 - Clarity
 - Accuracy
 - Don't add extra junk
- Pretty doesn't count, except in fashion!

The End