



Numerical Graphics

GC

Why do things go wrong?

- stem 'n leaf diagrams
- histograms
 - relative, absolute
- time series
- bar charts
 - segmented bar charts
- pie charts
- box 'n whisker diagrams

Focus still on one set of values, not relations.



Labelling

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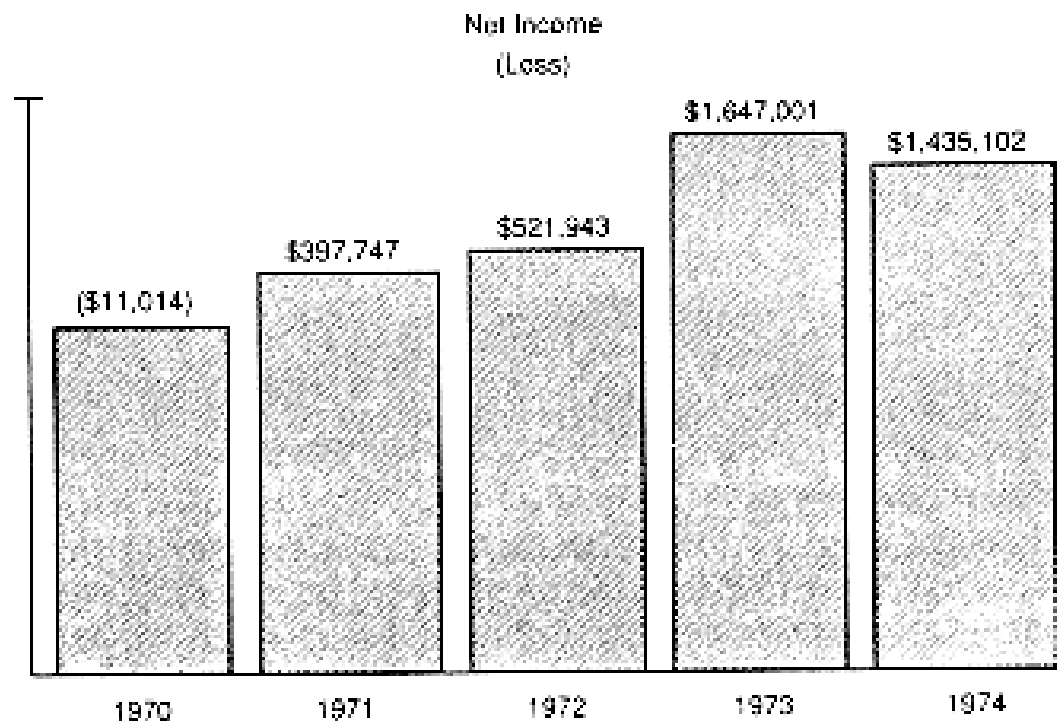


Figure 2 Annual Report

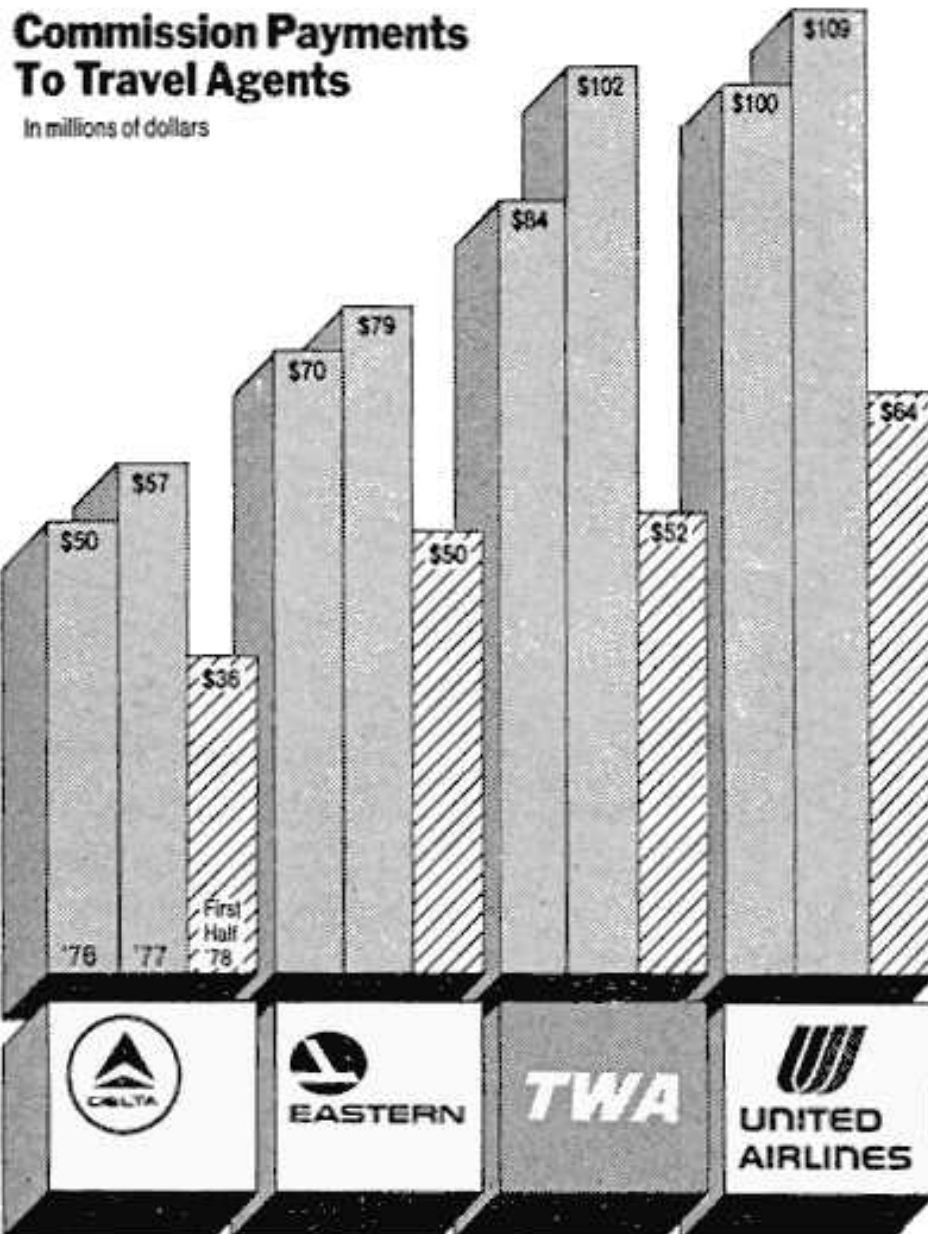
from A.K.Dewdney's *200% of Nothing*, p.19

- labelling of y axis
- accounting convention — loss in parentheses



Comparability

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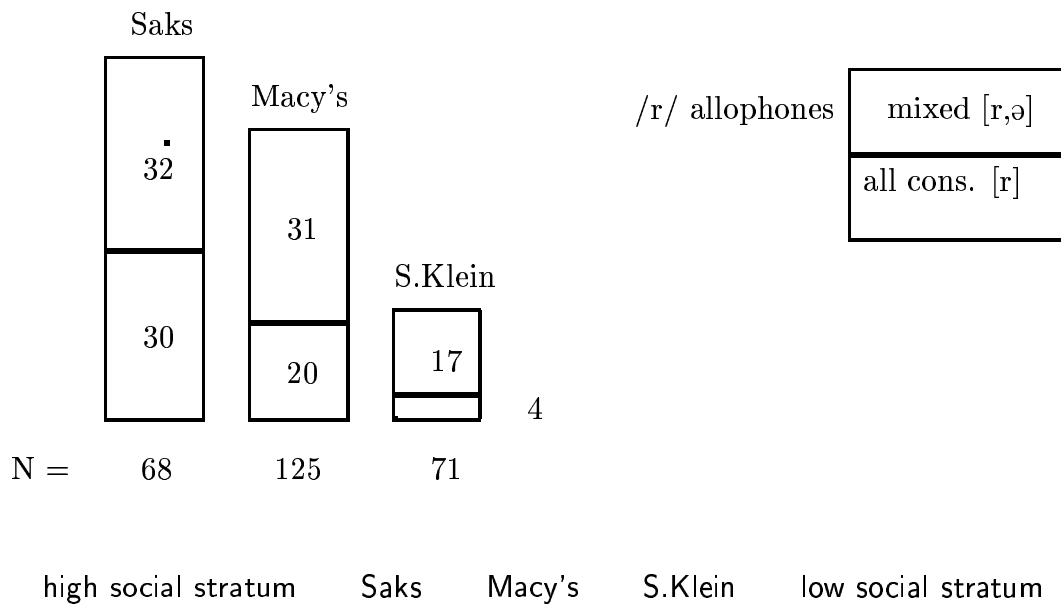
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Completeness

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W.Labov "The Social Stratification of [r] in NYC"



[r] is more prestigious than [ə]

What is graph showing/hiding?

(missing) top segments ~ prestigious pronunciation



Length/Width vs Area

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THE SHRINKING FAMILY DOCTOR In California

Percentage of Doctors Devoted Solely to Family Practice

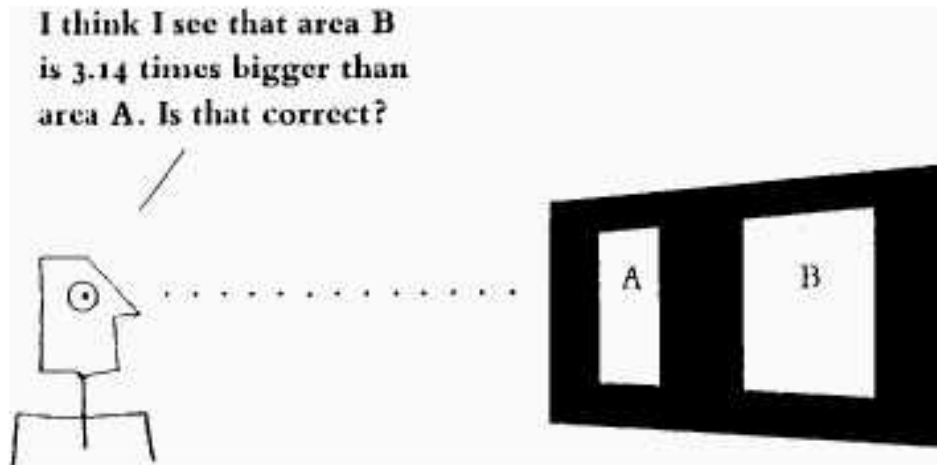
1964	1975	1990
27%	16.0%	12.0%





Lines, Areas, & Size

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we tend to perceive “size” as proportional to area



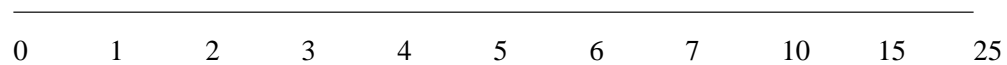
Histograms

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consider income data from 1973 (tabular)

income (K\$)	%
0–2.5	5
2.5–5	10
5–7.5	12
7.5–10	13
10–15	26
15–25	24
25–50	8
50–∞	2

numeric scales can't accept tabular divisions blindly

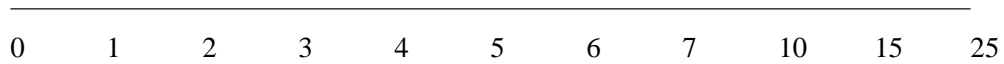




Histograms

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numeric scales must be reflected proportionally

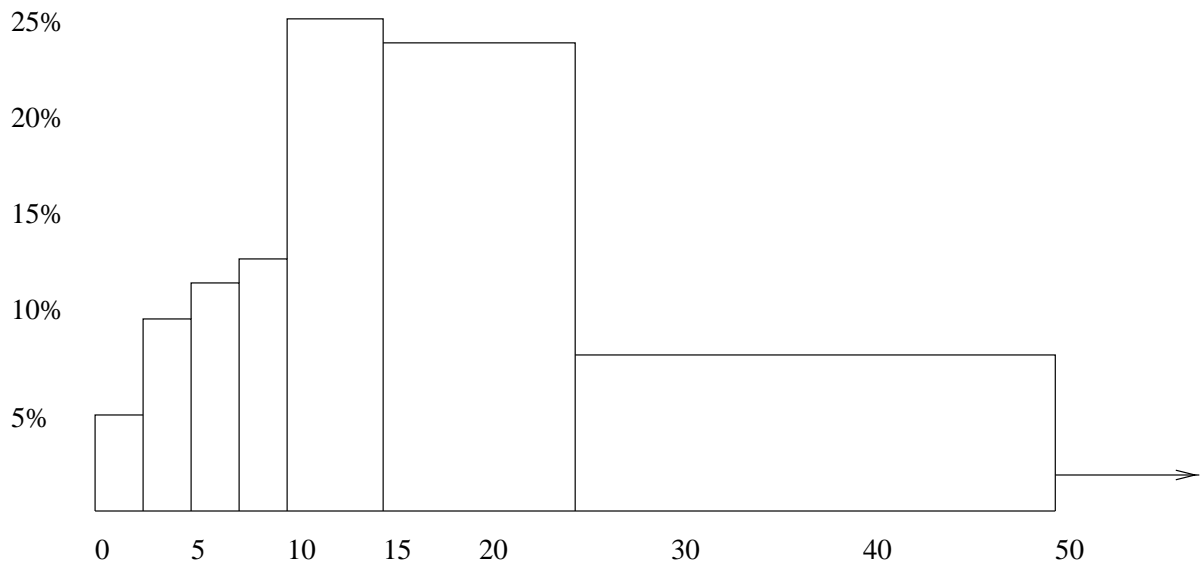




Histograms

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block heights must *not* reflect percentage!



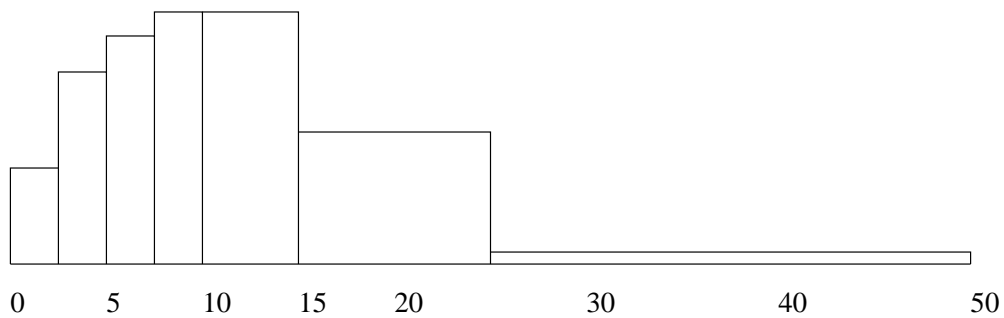
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50-∞	2



Histograms

GC

block areas must reflect percentage!



but what does y axis reflect?

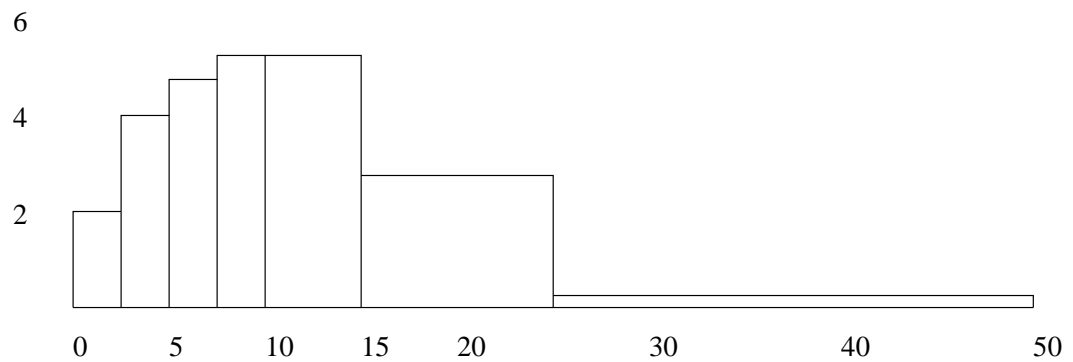


Histograms

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What does y axis reflect?

% per mille

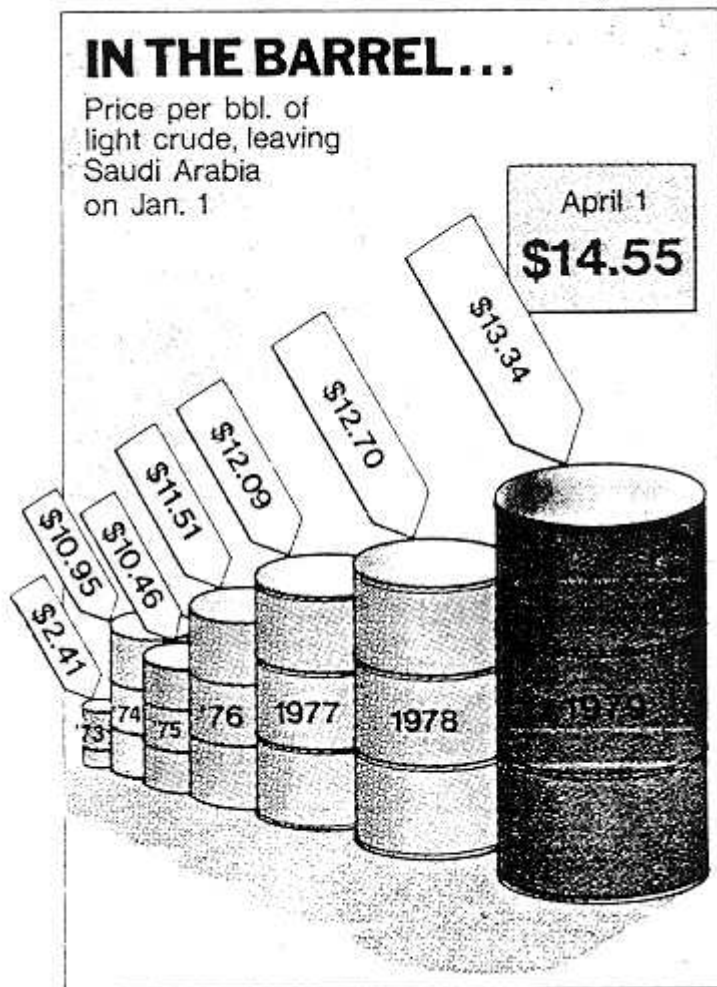


- SPSS, Excel draw histograms correctly
- correct drawing determined *not* technically but based on graphic perception



Suggestion of Volume

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care is needed!

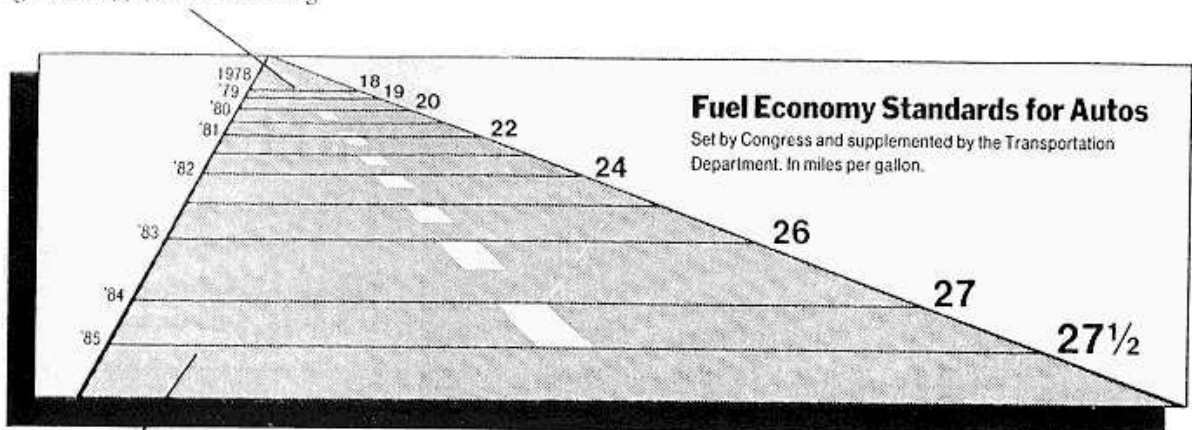
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Perspective

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This line, representing 18 miles per gallon in 1978, is 0.6 inches long.



This line, representing 27.5 miles per gallon in 1985, is 5.3 inches long.

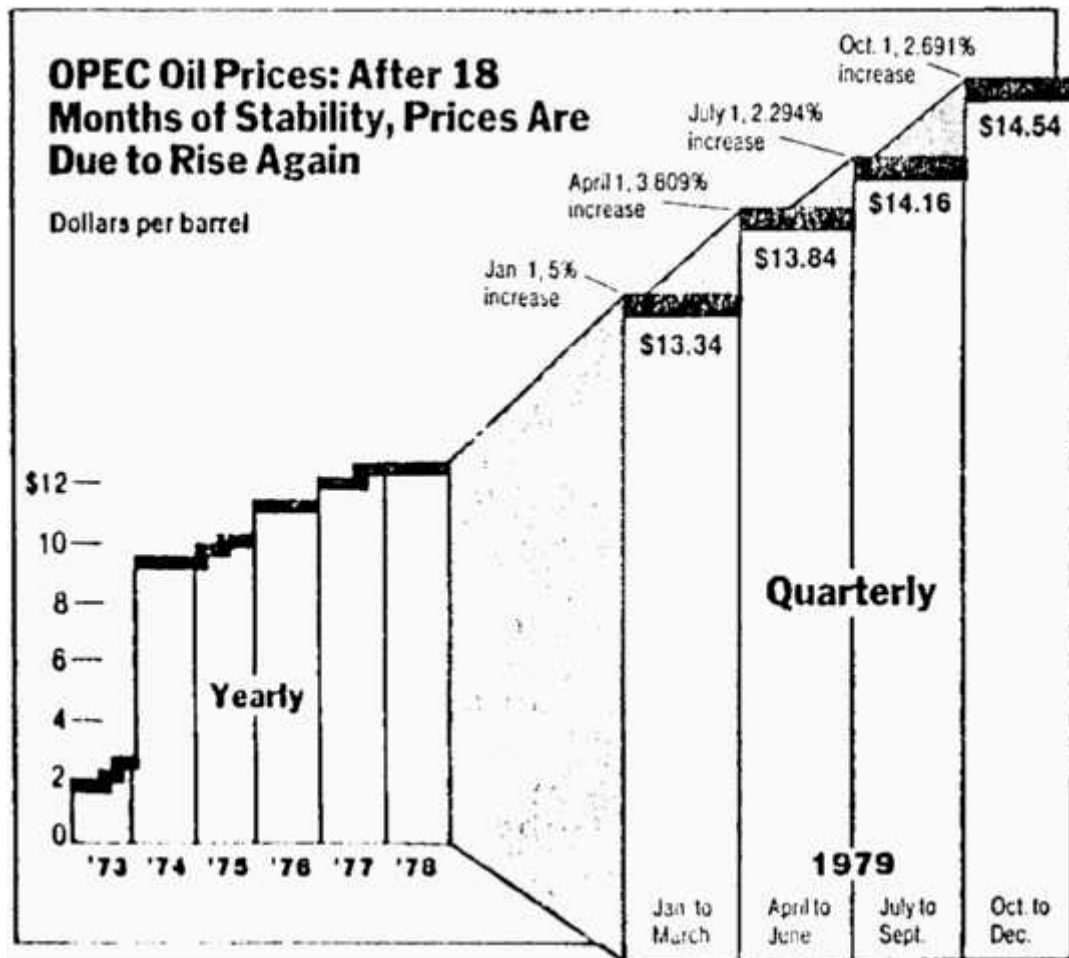
problem: human eye “corrects” for perspective



Foreground/Background

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(1) what happens to vertical scale?

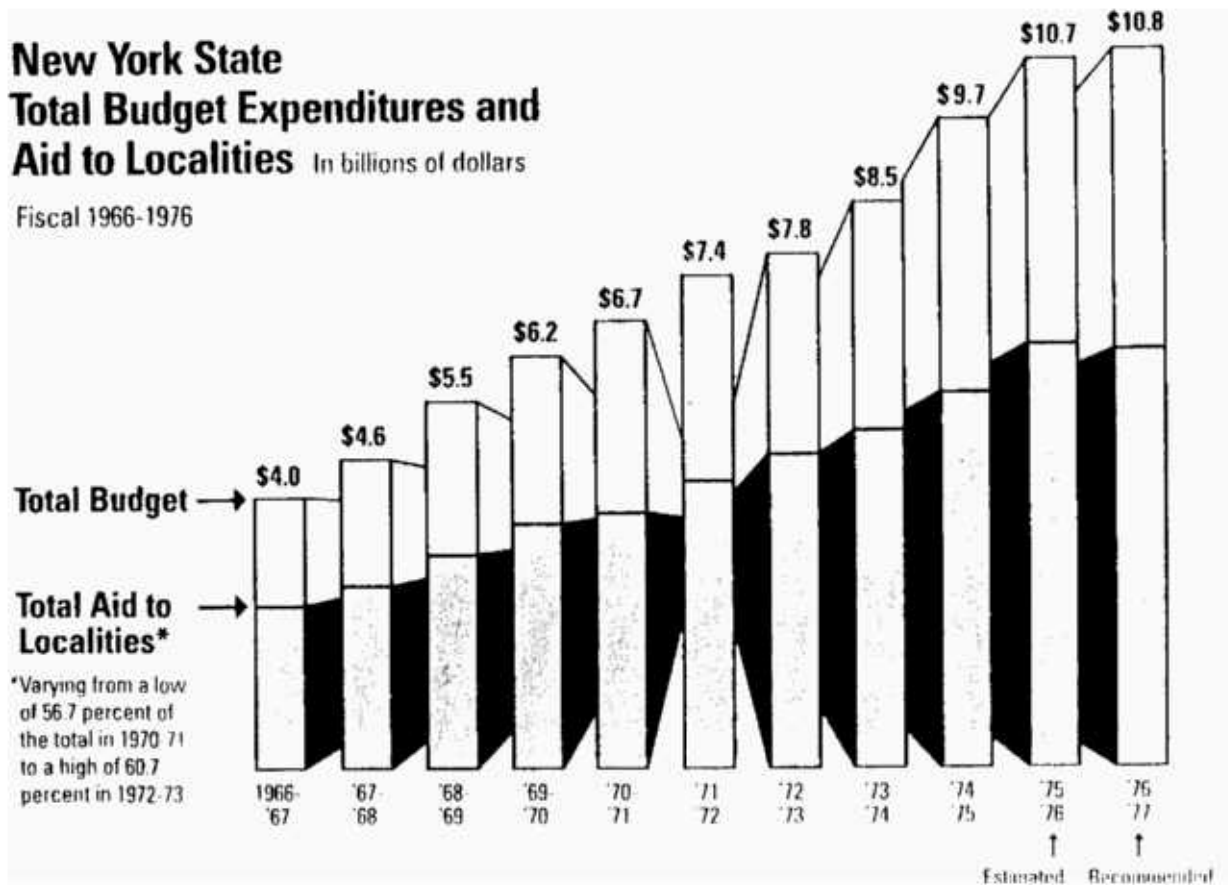


(2) area is *seen*, but only height is interpretable



Foreground/Background

GC

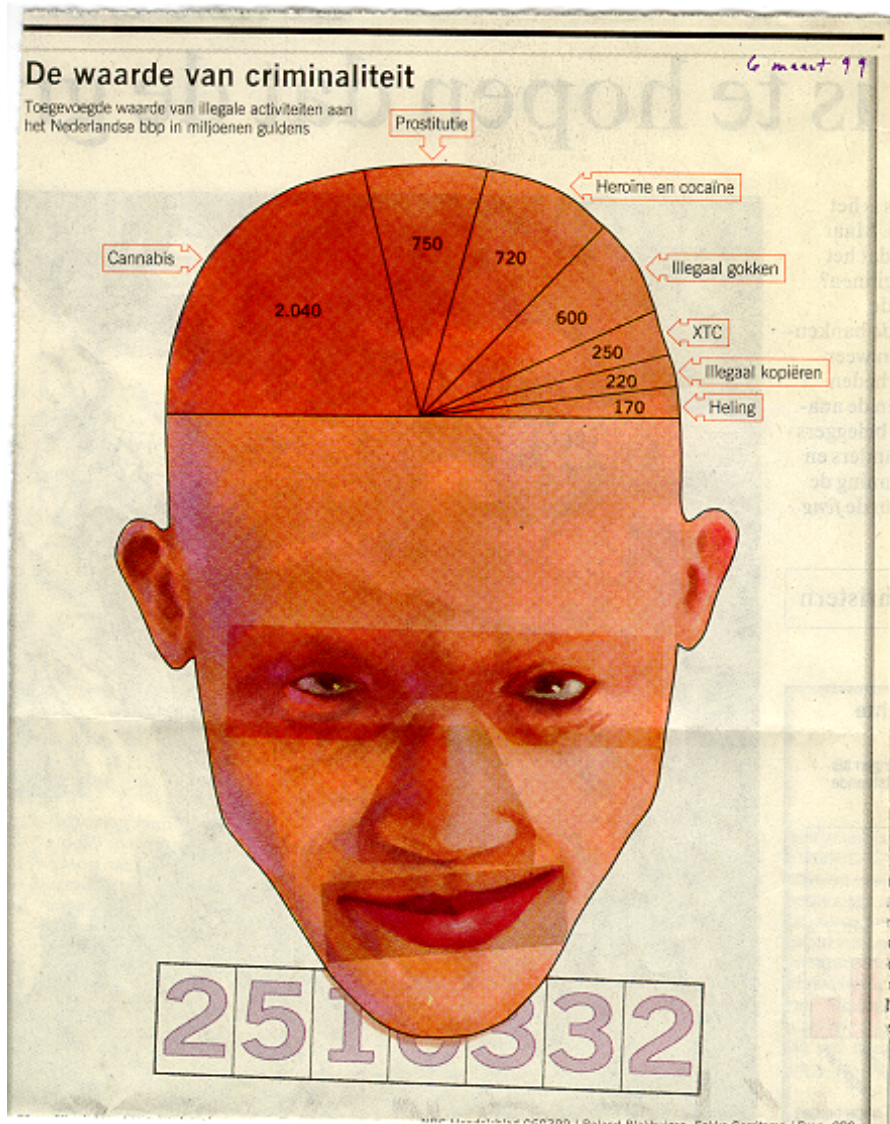


- no correction for inflation, population growth
- visual extension left (print) suggests long period of low taxes
- visual extension right (arrows) suggest even higher levels recently



Suggestive “Chartjunk”

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NRC suggestive, but honest?

RUG



Relations Disguised

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