

Playing
dumb:the
misuse of
Statistics in
Biology

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Preliminaries

Braindead
graphs

Statistics has
confirmed it.
What!?

What should I
do then?

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Outline

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1 Preliminaries

2 Braindead graphs

3 Statistics has confirmed it. What!?

4 What should I do then?

Statistics – seems like but – is not magic!

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- In its origins, created to make sense of incomplete data/information;
- A useful, powerful and flexible way of coping with uncertainty;
- Widespread (mis)use in modern science

Braindead graphs I - Why the heck 3D?

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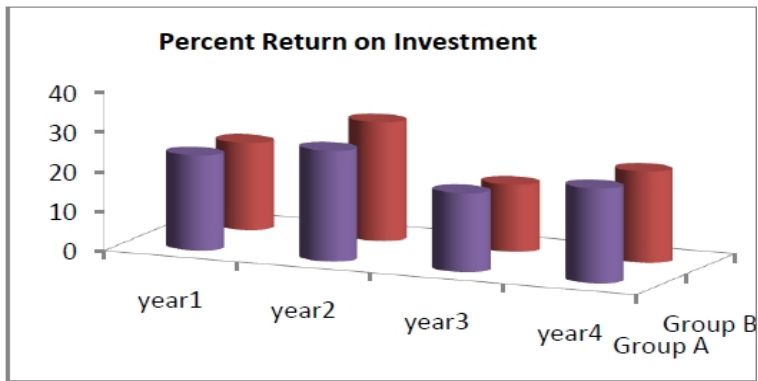
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Braindead graphs II - stick with 2D

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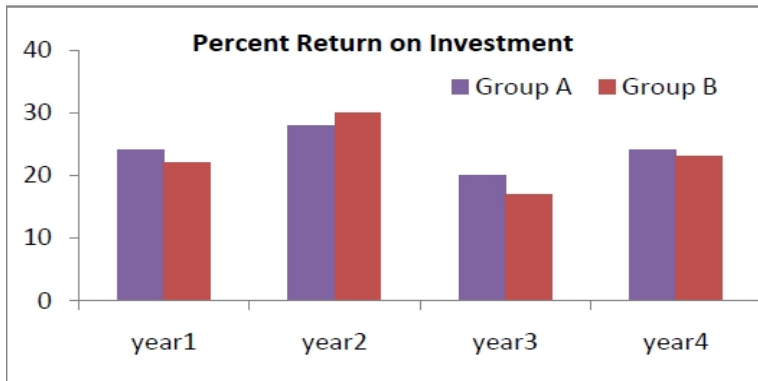
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Spreads matter

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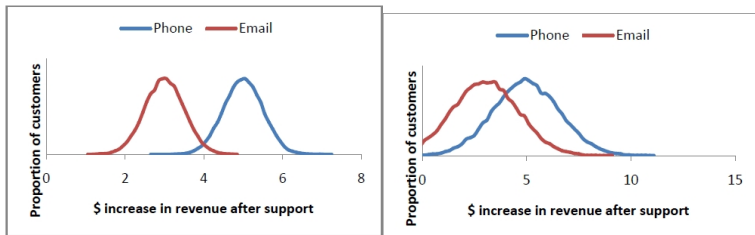
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Dynamite is a bomb!

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- Don't show data variation;
- Who said means mean anything?
- Where are the data?

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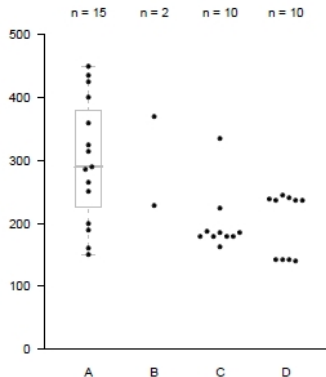
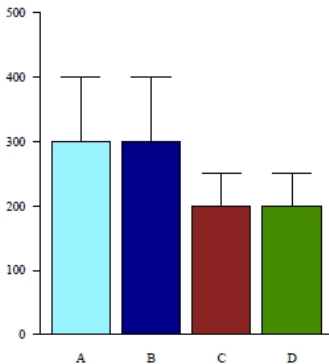
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I took the mean of an intervalar scale! Oh, please...

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do then?

Beverage	Average Rank
Coca-Cola	1.6
Pepsi	3.3
Dr. Pepper	4.4
7up	4.9
Ginger ale	5.2

Oh, so tiny!

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- Asymptotic normality;
- Power;
- Multiple testing

There's a linear relationship. What!?

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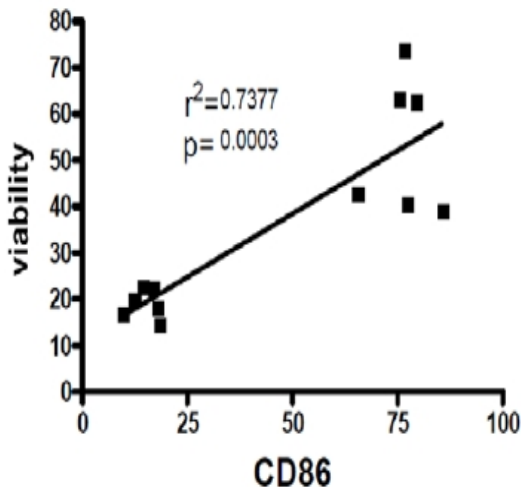
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- OLS assumes normality and homokedasticity
- You only need two points to make a straight line
- Residuals analysis is as much important as everything else

What should I do then?

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What should I
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- Try and show the data;
- Avoid unnecessary multiple testing
- Non-parametrics and Bayesian alternatives
- Power Calculations

Tanquiú iú véri mãiti!

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