

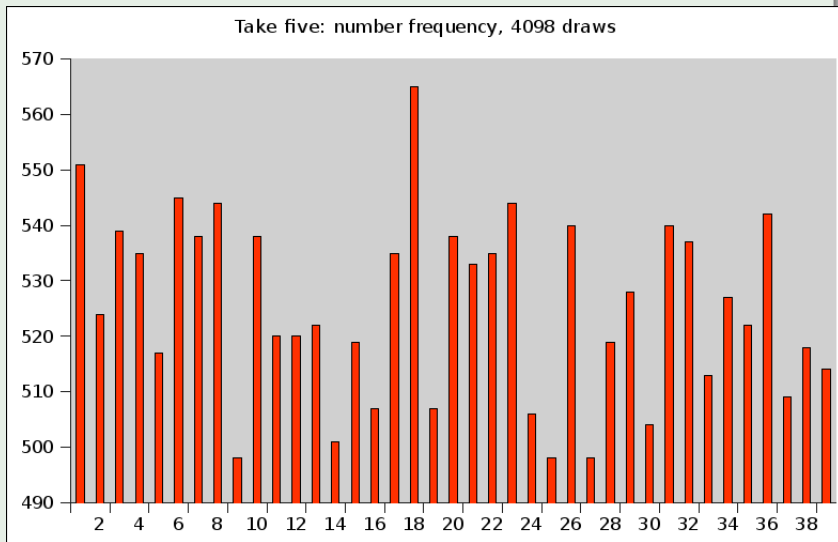
Introduction

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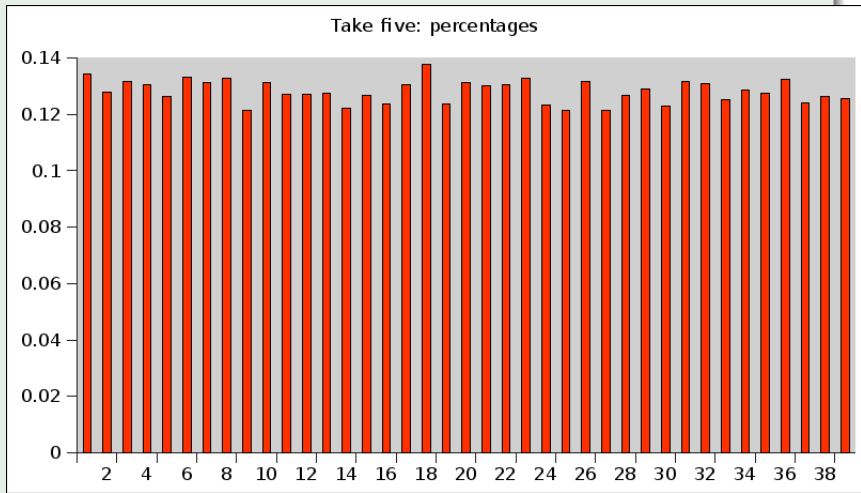
01/19/2011

Numbers vs percentages

Example (Take five)



Example (Take five, part 2)



Example

Claim: Syracuse schools are better than Hamilton schools because they have twice as many National Scholarship finalists. What do you think?

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Fact

Percentages are useful for comparing population of different sizes.

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- 1 *compare it to something else*

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- 1 *compare it to something else*
- 2 *see if it is growing or decreasing*

Example

Fleischmann's Rapid Rise yeast claims that it rises 50% faster. If a pizza recipe says to let the dough rise 1 hour, how long should we let it rise with rapid rise yeast?

Example

Is it a good idea to test everyone for HIV antibodies?

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- people with antibodies test positive 99% of the time.
- people without antibodies test negative 99% of the time
- 1.1 million out of 310 million Americans have HIV antibodies
- everyone was tested.

What fraction of those whose tests are positive are positive?

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Fact (Basic Idea)

If the treatment group has a different response, that response must have been caused by the treatment variable.

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Suppose that we want to study the effect of partying in college to lung cancer. Smoking is a **confoundly variable**, because those who party are more likely to smoke, and smoking is related to lung cancer.

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- ① *Placebo: a non-medical treatment, given to the control group so that they do not know which group they are in.*
- ② *Double blind experiment: neither the subjects nor the doctors who measure the responses should know who was in the treatment group and who was in the control group.*

Ideal (gold standard) experiment

Fact

*Randomized controlled double blind experiment: Take a population, divide it randomly into two groups, compare the results and decide whether **chance** could have produced the result.*

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Examples:

- *effects of gender on career path*
- *effects of black holes on nearby stars*
- *effects of minority status on income path*
- *effect of diet on health*