Statistical Significance: A non-mathematical explanation[1]

There is a statistical way of testing the likelihood that an observed difference is due to chance. The factors that go into the calculation include the size of the difference, and the number of observations. In the simple example of coin tosses, the expected value is 50% heads, and 50% tails. If you toss a coin four times, and get 3 heads and 1 tail, this difference would not be statistically significant - even though it is 25% different from what you would expect. This difference could easily be due to chance.

if you tossed a coin 100,000 times, and 75% were heads and 25% were tails, the difference from the expected value would be statistically significant (and you would be justified in being suspicious of the coin).

Based on the statistical techniques commonly used in social sciences, even when a difference seems big, if the number of cases is small, you may not be able to confidently say that the difference is due to anything other than chance.

On the other hand, with very large samples, even differences that seem small may be statistically significant. For example, if you tossed a coin 100,000, even a difference of 1% more heads than expected would be statistically significant.

The computer programs that social scientists use for statistical analysis calculate measures of statistical significance. These programs will often produce a “p value”. A p value of .05 means that there is a 5% chance that the difference is due to chance, and a p value of .01 means that there is a 1% chance that the difference is due to chance.

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[1]Prepared by Patty Glynn, University of Washington, 12/24/02. C:\all\help\helpnew\statistical_difference.wpd