Statistics for Science Fair Projects

chi-square (contingency)

	short	tall
☺	10	25
☹	20	5

To analyze, get frequency counts for each combination (e.g., number of happy tall people)

$\chi((r-1)*(c-1))=\#.\#\#$, $p=.\#\#$

If you would like to compare with norms, conduct a "**goodness of fit" chi-square** (e.g., compare flipping a coin 20 times with 10 heads and 10 tails).

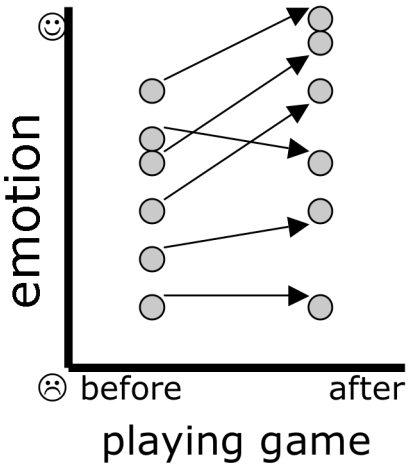
t-test (independent samples)

To analyze, get average, standard deviation, and number for each group (e.g., happy & sad people).

$t(n_1+n_2-2)=\#.\#\#$, $p=.\#\#$

If you have more than 2 bars, conduct an **ANOVA**. ANOVA even lets you compare clusters of bars (e.g., 3 sets of 2 bars).

t-test (paired sample)

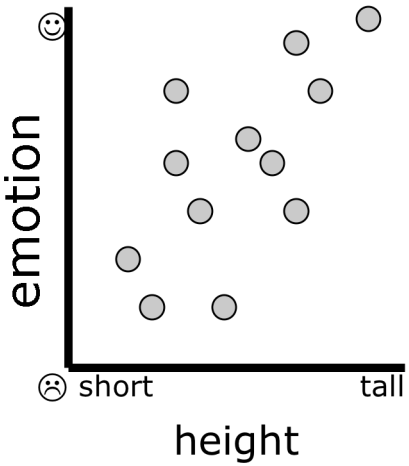


To analyze, get pairs that match (e.g., before vs. after scores; parent vs. child scores).

$t(N-1)=\#.\#\#$, $p=.\#\#$

Repeated-measure **ANOVA** have sets of more numbers (e.g., before, after, and way after) and/or more dimensions (e.g., happy people before vs. after, sad people before vs. after).

correlation



To analyze, get pairs that match (e.g., Jen's height and emotion, Sam's height and emotion).

$r=.\#\#$, $p=.\#\#$, $n=\#\#$

If you have more than two variables (i.e., X and Y), then conduct a **regression** (e.g., X, Y, and Z).

Above are four columns that summarize each of the four most common science fair project statistical analyses. Each column has: (1) name of statistic, (2) picture to represent statistic with made-up data, (3) information to gather for statistical analysis, (4) how to write the statistical result, and (5) related alternative or more advanced statistics. Calculators to analyze statistics available at PerplexingQuestions.org . To write statistic, keep italics and replace text in green courier as follows: r (# of rows), c (# of columns), # (numbers), n_1 (# in sample 1), n_2 (# in sample 2), N (# in total sample).

PerplexingQuestions.org ~ Dr. Kevin Grobman