Analysis of Variance

- **In an experiment, scores on the dependent variable measure vary. Why do they vary?**

- **Systematic variance is the variability in scores due to the effect of the independent variable. When systematic variance is large, a statistically significant result is more likely.**

- **Error variance is variability in scores that is due to unexplained reasons or "error." Error variance is reflected in the variability of scores within each group of the experiment. When error variance is small, a significant result is more likely.**

- **In an independent groups design with simple random assignment:**

TOTAL VARIANCE = SYSTEMATIC VARIANCE+ERROR VARIANCE

- **With matched random assignment or repeated measures designs:**

TOTAL VARIANCE = SYSTEMATIC VARIANCE+SUBJECT VARIANCE+ERROR VARIANCE

Because variability due to subject variance can be identified, the unexplained "error" variance is smaller.

- **Matching and repeated measures procedures thus have a statistical advantage over an independent groups design with simple random assignment.**