Psy 511  Fall 1988:  Introduction to Statistical Inference and Analysis of
                      Variance & Design of Experiments

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Lectures: 930 – 1020 Tu & Th – 154 Straub
                     M & F  – 179 Straub

Lab (Rocklin) : 1130 – 1220 W – 179 Straub

Text:  Hays, W. L. STATISTICS (4th Ed)
       SAS Manuals
       VAX Users Guide

       TOPICS

I.  Introduction to Statistical Inference (Hays Ch 1-8)

II.  Univariate analysis of variance (ANOVA) & design of experiments

    1. Introduction:   the chi-square and F distributions (Hays, Ch 9)

    2. Single factor ANOVA designs (Hays Ch 10)

        A.  General linear model
        B.  Partitioning total sum of squares
        C.  Expected mean squares and the F test
        D.  Power of the F test
        E.  Robustness of the F test

    3. Introduction to linear regression & correlation (Hays Ch 14)

    4.  Asking specific questions of data (Hays Ch 11)

        A.  Error rates
        B.  Contrast analysis
        C.  Planned comparisons
        D.  Trend analysis:  orthogonal polynomials
        E.  Comments on post hoc comparisons:  data snooping

5. Completely randomized multifactor designs (Hays Ch 12 & 13 through Sec. 13.17)

    A. Fixed and random factors; mixed models
    B. Fixed effects model
    C. Expected mean squares & F tests
    D. Orthogonal contrasts & factorial designs
    E. Power
    F. Trend analysis
    G. Analysis of interaction

Psy 511. Problem Set #1.

1. In a certain federal prison it is known that 2/3 of inmates are under 25 years of age. It is also known that 3/5 of the inmates are male and that 5/8 are female or 25 years of age or older. What is the probability that a prisoner selected at random from this prison

   a) is female and at least 25 years old?

   b) is female if at least 25 years old?

2. Hays #18 pp. 59-60.

3. Given that (a) 10% of women attend college, (b) 80% of college women smoke pot, but (c) only 50% of all women smoke pot. Suppose a woman is selected at random from the population and is observed to be smoking pot. What is the probability that she is a college woman?

4. Three archers A, B, and C each shoot one arrow at a target. The probabilities of hitting the target are:

P(A hits) = 0.5
P(B hits) = 0.25
P(C hits) = 0.75

Determine the probability for each of the following outcomes:

   A. A and B both hit the target
   B. A and B both miss the target
   C. A or B will hit the target
   D. All three will miss the target
   E. A or B or C will hit the target

5. Hays #22 pp. 60-61.