

Chapter 6 - Practice Problems

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Part 1 - IDENTIFY THE METHOD OF ANALYSIS

- A) PAIRED COMPARISON - 2 TREATMENTS, P OUTCOMES, n SUBJECTS
- B) REPEATED MEASURES FOR COMPARING TRTS - q TRTS, SINGLE OUTCOME, n SUBJECTS
- C) COMPARING MEANS FROM 2 POPULATIONS - INDEPENDENT SAMPLES, P OUTCOMES
 n_1, n_2 SUBJECTS
- D) 1-WAY MULTIVARIATE ANOVA - P OUTCOMES, g GROUPS, n SUBJECTS IN TOTAL
- E) 2-WAY MANOVA - BALANCED (n SUBJECTS/TRT) P OUTCOMES
- F) PROFILE ANALYSIS - 2 GROUPS, P OUTCOMES MEASURED ON SAME SCALE
- G) REPEATED MEASURES / GROWTH CURVES - ≥ 2 GROUPS, P OUTCOMES OF SAME MEASUREMENT @ VARYING TIMES/INTENSITIES

- 1) 2 Suntan Spray products to be compared wrt 2 responses:
 $X_1 =$ Color tone, $X_2 =$ Consistency (each measured analytically).
24 subjects received each product $\left\{ \begin{array}{l} 12 \text{ A/LEFT B/RIGHT ARM} \\ 12 \text{ A/RIGHT B/LEFT ARM} \end{array} \right.$
(ARM BALANCED, BUT NOT A FACTOR IN MODEL).

- 2) A study involved Electronic Readers in terms of 2 responses: $X_1 =$ Reading Time, $X_2 =$ Comprehension Accuracy.
There were 3 ~~at~~ electronic Reader devices and 4 illumination levels. The study involved 60 subjects, who were randomized so that 5 received each combination of Device and Illumination Level.

- 3) Porcelain samples from 2 periods in China were obtained. Period 1 was the Kangxi Period (1661-1722), Period 2 was the Qianlong Period (1735-1795). There were $n_1 = 21$ specimens from period 1 and $n_2 = 26$ from period 2. Two oxide concentrations were measured on each specimen: $X_1 = \text{SiO}_2$ and $X_2 = \text{CaO}$.
- 4) Among a sample of NBA players, the effect of playing home versus away was studied. For each player sampled, their average home points, rebounds, and assists were obtained for the season. Also, their average Away points, rebounds, and assists were obtained. There were $n = 50$ players sampled.
- 5) A comparison of 2 Superabsorbent Polymers (SAP) was conducted. Each sample consisted of 10 filaments. ~~were obtained~~ The effect of repeated washing of the filaments was studied, with vapor absorption (%) being measured before washing (0 trts), and after 1, 2, 3, 4, 5 Washing treatments. The goal was to compare the 2 SAPs over time.

6) Two Brands of Orange Juice are to be compared. There are 3 taste "criteria" they are to be rated on: flavour intensity, Sweetness, Sourness. Each juice was rated on a 1-5 scale by a sample of 30 judges.

7) An experiment considered the effect of 11 treatments (groups of types of sugarcane pests) on 2 responses: $X_1 =$ Weight of canes, and $X_2 =$ weight of juice. There were 6 replicates (sugarcanes) per treatment.

8) An Anthropological study involved measurements among samples of 30 Lahoul Kanets and 60 Kulu Kanets in Punjab. The authors reported $X_1 =$ stature (Height), $X_2 =$ Armspan, and $X_3 =$ Left Foot Length.

9) CO_2 Exchange (ΔCO_2 /plant fresh mass) for plants under 2 conditions (Wet/Dry) @ 4 time points (3 reps/trt).

10) A food tasting experiment considered the placement of food (symmetric/balanced vs asymmetric/unbalanced) and color of plate (monochrome vs colorful) on 3 responses: $X_1 =$ Attractiveness score (-100 to 100), $X_2 =$ Willingness to try (0 to 100), $X_3 =$ Hedonic Score (-100 to 100) $n = 17$ subjects/trt.

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- 11) An experiment was conducted to compare 2 life jackets (jacket based on 3D shape of human body and a manufactured life jacket). There were 4 characteristics evaluated on each jacket by 16 subjects (each subject rated both jackets on all characteristics).
- 12) A study compared 4 brands of antiperspirant. A sample of 24 subjects were obtained, and each subject was measured on each antiperspirant. The response measured was percent sweat reduction.
- 13) A study compared chicken weights among 4 diets. The diets corresponded to a crossing of 2 factors, each @ 2 levels: Base Diet (Corn vs Sorghum) and Methionine Additive (Present vs Absent). There were 60 chickens in each treatment, with $N=240$ total chickens. The following weight measurements were made on each chicken at end of study:
- $X_1 = \text{Thigh}$, $X_2 = \text{Drumstick}$, $X_3 = \text{Wing Drumette}$.