

Factorial Designs in JMP



• 1

TimesToCampus(2x2)
(IBRD)

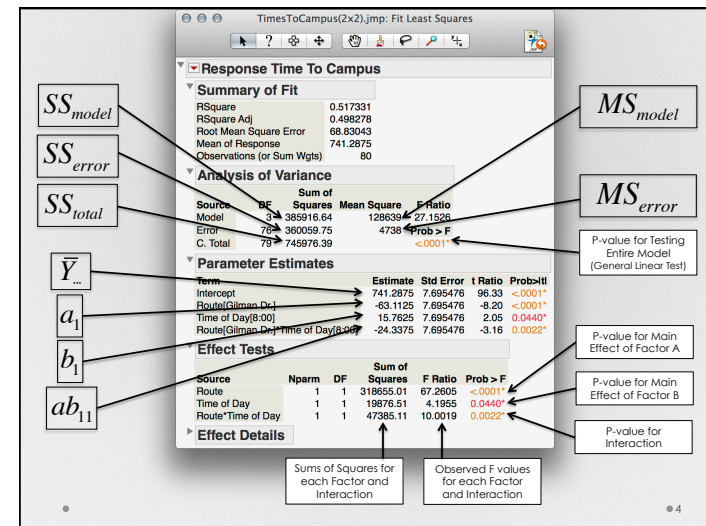


Time (in seconds) to Campus
By Route (2-levels) and Time of Morning (2-levels)

Route	Time of Day	Time To Campus
1 Gilman Dr.	8:00	689
2 Gilman Dr.	9:30	647
3 La Jolla Village Dr.	8:00	1036
4 La Jolla Village Dr.	9:30	821
5 Gilman Dr.	8:00	743
6 Gilman Dr.	9:30	614
7 La Jolla Village Dr.	8:00	836
8 La Jolla Village Dr.	9:30	782
9 Gilman Dr.	8:00	662
10 Gilman Dr.	9:30	742
11 La Jolla Village Dr.	8:00	918
12 La Jolla Village Dr.	9:30	797
13 Gilman Dr.	8:00	809
14 Gilman Dr.	9:30	717
15 La Jolla Village Dr.	8:00	793
16 La Jolla Village Dr.	9:30	805
17 Gilman Dr.	8:00	551

• 2

• 3



• 4

Two Factor Experimental Designs larger than 2x2

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Two Factor Linear Model (Sample Model)

$$Y_{ijk} = \bar{Y}_{...} + a_j + b_k + (ab)_{jk} + e_{ijk}$$

Score on Y for the *i*th individual in the *j*th treatment of factor A, and *k*th treatment of factor B = Grand Mean + Effect offset for level *j* of Factor A + Effect offset for level *k* of Factor B + Effect offset for combined effect of Factors in treatment *jk* + Error

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Tests of Effects for Two Factors

- Overall Effect of Factor A

$$F_A = \frac{MS_A}{MS_{error}}$$

- Overall Effect of Factor B

$$F_B = \frac{MS_B}{MS_{error}}$$

- Effects of Specific A & B Combinations:

$$F_{AB} = \frac{MS_{AB}}{MS_{error}}$$

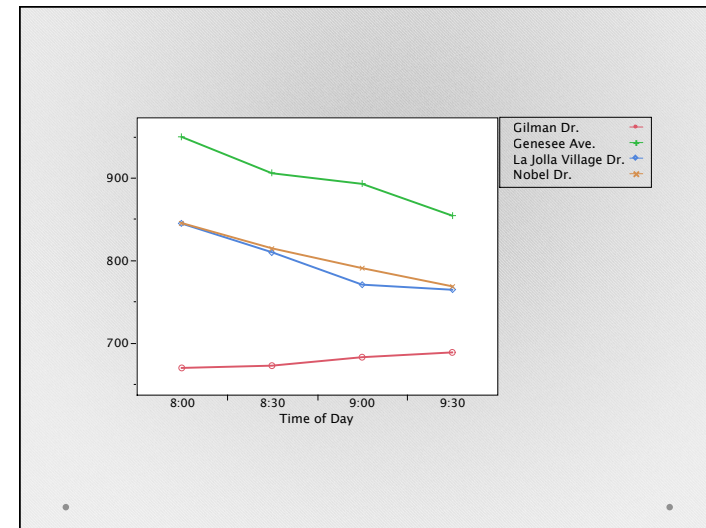
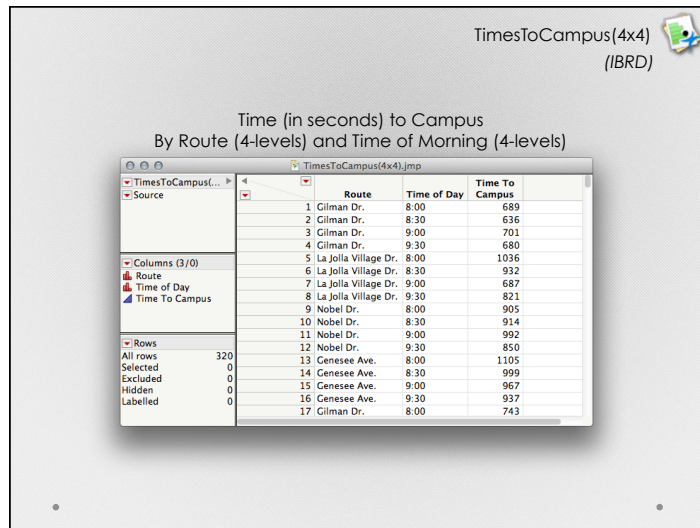
• 7

TimesToCampus(4x4)
(IBRD)

Time (in seconds) to Campus
By Route (4-levels) and Time of Morning (4-levels)

Route	Time of Day	Time To Campus
1 Gilman Dr.	8:00	689
2 Gilman Dr.	8:30	636
3 Gilman Dr.	9:00	701
4 Gilman Dr.	9:30	680
5 La Jolla Village Dr.	8:00	1036
6 La Jolla Village Dr.	8:30	932
7 La Jolla Village Dr.	9:00	687
8 La Jolla Village Dr.	9:30	821
9 Nobel Dr.	8:00	905
10 Nobel Dr.	8:30	914
11 Nobel Dr.	9:00	992
12 Nobel Dr.	9:30	850
13 Genesee Ave.	8:00	1105
14 Genesee Ave.	8:30	999
15 Genesee Ave.	9:00	967
16 Genesee Ave.	9:30	937
17 Gilman Dr.	8:00	743

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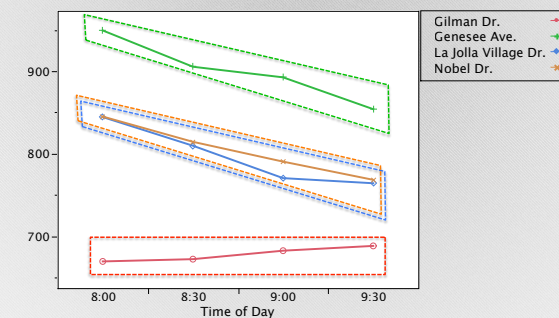


Slices in Factorial Designs

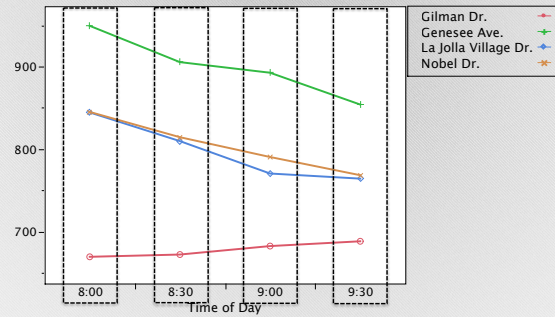
A test of a "slice" is a linear contrast testing the overall effect of one factor at a single level of another factor

i.e. One-Way (single factor) analysis of variance for the factor being tested, holding constant the level of another factor. Often called a sub-design ANOVA

Slices in Factorial Designs



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